NEW-YORK FARMER,

AND

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NEW-YORK FARMER.

FEBRUARY 1, 1837.

ERRATA.—In *making up* the last eight pages of this number of the Farmer, the two columns on the 57th page, were, through mistake, transposed. The *last* should be *first*, and the *first* column *last*, in order to read correctly.

NOTICES OF AGRICULTURAL AND HORTICULTURAL WORKS.

MAGAZINE OF HORTICULTURE.—Formerly known as the Gardener's Magazine. The January Number of this work is highly interesting and original. The article on "the progress of Horticulture in the United States," by A. J. Downing, of Newburgh, is full of interest, we shall notice some particulars of it at another time.

FARMERS' REGISTER.—This work also commences the year with a very fair number. Several articles in it gave us great pleasure in the perusal.

SCIENTIFIC AND LITERARY JOURNAL.—This work is a continuation of the Scientific Tracts, so well known for neatness of execution and value of matter. The new and enlarged form of the work will retain the same character.

CHESS—BROMUS SECALINUS.

Many of our agricultural papers have recently published articles on the subject of the conversion or degeneration of Wheat into Chess. We have been rather surprised to find that several have embraced the opinion that such change does really take place.

They rest the proof of their position upon the supposed facts, that chess has been found growing from a grain of wheat, and that clean wheat, sown on certain kinds of ground, has returned almost nothing but chess.

Many persons might be deceived by an instance of the first case, while a careful examination would show their error. We have heard of several supposed cases, of a stalk of chess growing from a grain of wheat, where a close examination by a skilful observer has detected the mistake.

As to the latter case, in the same way, we have seen wheat and rye turned into what are commonly called *wild turnips*.—Improper seeds may exist in the soil previous to the sowing of pure grain, and these will most assuredly come up and flourish as well as the good grain, and sometimes, being more hardy or earlier, may altogether overcome it.

It is a principle in nature, that genuine distinctions can by no process of art be changed, the one into the other, and wheat and chess belong to very distinctly different genera. It is not even likely that the pollen of the one, fertilizing the pistils of the other, has produced a mongrel or hybrid, for we do not hear of any intermediate plant, such as would be the result of a mixture.

Providence has wisely appointed, that what a man sows he shall reap, and does not suffer him to receive in return for the most useful of all grains, a useless and even deleterious seed.

We should not have noticed this matter, had we not seen in print several articles, evidently written by firm believers in vegetable transubstantiation. Desiring to correct a heresy so gross, we have entered our protest against it.

The serious effects said to be produced by a large quantity of chess ground up with wheat, as giddiness and delirium, render it an important object to get rid of this plant. We suspect that sowing clean grain on clean ground will be found the very best method of accomplishing this object.

From the Montreal Morning Courier.

TO THE FARMERS OF CANADA.

AGRICULTURAL IMPROVEMENT, BY THE EDUCATION OF THOSE THAT ARE ENGAGED IN IT AS A PROFESSION.

NO. 1.

"Whatever be the position of man in society, he is in constant dependance upon the three kingdoms of nature. His food, his clothing, his medicines, every object either of business or pleasure, is subject to fixed laws; and the better these laws are understood, the more benefit will accrue to society. Every individual, from the common mechanic, that works in wood or clay, to the Prime Minister, that regulates with a dash of his pen the agriculture, the breeding of cattle, the mining, or the commerce of a nation, will perform his business the better, the better he understands the nature of things, and the more his understanding is enlightened. For this reason, every advance of science is followed by an increase of social happiness"—says political economy.

The citizens of Montreal and Quebec appear to have been a good deal interested lately on the subject of education. The excellent lectures of Dr. BARBER, have, I believe, increased this interest, and there is every reason to hope, that much good will be produced in consequence. Whether it is in contemplation to extend the benefits of education beyond the bounds of those cities, I am unable to say, and from this uncertainty, I am induced to address the agricultural population, and endeavor to convince them, that if education is useful and necessary for the inhabitants of cities and towns, it will be found equally advantageous and pleasing for those of the country. I am sorry to say, there is practical proof in most countries, that education is not considered by *all*, to be essential to render every man competent for performing the part which he undertakes, or which his circumstances oblige him to perform in life, with advantage and satisfaction to himself and others. Hence it is that education is much neglected, and from this cause agriculture must languish, and never will be in a flourishing condition, unless a larger proportion of the occupiers and cultivators of the soil are usefully and practically educated. There are many circumstances connected with agriculture, besides ploughing, sowing, planting, and harvesting, that requires to be perfectly understood by the farmer, in order to ensure his success, and which an ignorant man never can understand. I would not continue a farmer *for one day*, were I convinced that it required neither education nor science to practice my profession profitably. From my youth, I have been taught to look upon the profession of a farmer, as above all other professions, and I confess this opinion has "grown with my growth, and strengthened with my strength." In the British Isles, I never heard this fact disputed. It is only when education is wanting, that the profession is lowered in estimation. From the very nature of things, agriculture being the source of all wealth, and more particularly so in Canada, why should education be less necessary for those who practise it, than for the merchant, manufacturer, or shopkeeper, the brewer,

the baker, and a host of other mechanics and tradespeople? To view the matter in another light, education increases knowledge, and knowledge gives power, which must be desirable, because it may be exercised advantageously in various ways. It then becomes a question of some consequence to ascertain how the power which knowledge confers is at present shared between the several classes which compose the population in Canada. I am sorry to say, that though the agricultural class forms an immense majority, that they are by no means educated in proportion to their numbers, compared with the other classes; and that consequently, a minority possess a preponderating power and influence.—There are various causes to which this state of things is to be attributed. It has often been to me a matter of regret, that few of the young men educated at the colleges and seminaries in Canada, hitherto, have become farmers. I suppose they must have considered that were they to settle on farms, their education would be of no value to them. They almost invariably apply themselves to the professions of lawyers, doctors, notaries, merchants, shopkeepers, or any other rather than to agriculture. This is one that it would appear is looked upon as a degrading profession for an educated young man. How strangely do men differ in their estimation of things? The greatest men of former ages, and *Washington*, of our own times, when they retired from public life, occupied themselves in husbandry, as the only employment fit for great men.

How injurious it must be, that those who are the best qualified to promote agricultural improvement, and raise the character of agriculturists, are withdrawn from that occupation, which ought to be honorable, and that station in society where, of all others, they might be most useful to the community. Farmers cannot occupy that high station they may and ought to do in British America, without a sufficient education. It is this alone that is necessary to qualify them to fill this station, and retain it. I will freely admit that a man may be well educated and not be a good farmer, because a practical knowledge of agriculture is necessary to constitute one. I am persuaded, nevertheless, that it will be difficult to find an uneducated man a good practical farmer, capable in all seasons, and in every circumstance, to make the most profitable use of his farm and opportunities. If education is necessary for men that are engaged in pursuits of infinitely less consequence to the world than agriculture, how can it be dispensed with by the farmer?

I would appeal to those who have had the advantage of a good education, and who make a good use of it, by continuing to be *reading men*, what would compensate to them for the want of education? Without including any of that knowledge obtained by education that is useful and profitable in common life, the man of science has other exquisite enjoyments to which the ignorant must ever be entire strangers. I cannot forego the opportunity to copy here a few lines from Dr. Dick—"If substantial happiness is chiefly seated in the mind, if it consists in the vigorous exercise of its faculties, if it depends on the multiplicity of objects which lie within the range of its contemplation—if it is augmented by the view of scenes of beauty and sublimity and displays of infinite intelligence and power—if it is connected with tranquility of mind, which generally accompanies intellectual pursuits, and with the subjugation of the pleasures of sense to the dictates of reason, the enlightened mind must enjoy gratifications as far superior to those of the ignorant, as a man is superior in station and capacity, to the worms of the dust."

My object in this communication, and those which I propose shall follow, is, to endeavor to engage the attention of agriculturists, in particular, to the all important subject of education. Without presuming to dictate, I shall simply submit for their consideration, in the clearest manner I am capable, the advantages and pleasures that would be likely to result to them, and to the whole community, from the useful, practical, and general education of the agricultural class. When I have done this, I shall next state what, in my humble judgment, is necessary to constitute this education, and how, subsequently to the period of leaving school, education may go on constantly, extending and improving during the full term of existence, with all such as are desirous of attaining useful knowledge without in any way interfering injuriously with their business as farmers. This latter point, I think, it must be essential to prove, and I expect I shall be able to do so satisfactorily. If I shall be unable to accomplish what I undertake, I trust, however, that what I may advance will be the means of inducing those who are more competent, to take the subject into consideration. If the prosperity of agriculture is promoted, it is of no consequence to me who shall be the instrument.

WILLIAM EVANS.

Cote St. Paul, Dec. 28, 1836.

From the Montreal Morning Courier.

TO THE FARMERS OF CANADA.

AGRICULTURAL IMPROVEMENT, BY THE EDUCATION OF THOSE THAT ARE ENGAGED IN IT AS A PROFESSION.

NO. 2.

What are the advantages that are likely to result, from the useful, practical, and general education of the agricultural class?

To this question I reply, that an improved system of agricultural management would inevitably be introduced, by which it would be possible to augment the produce and returns obtained from the cultivated land, and stock in these Provinces, to double what they are at present, and in many instances, much more; and I am firmly persuaded, that no material improvement will ever be effected in the agriculture of the Canadas, until farmers do become usefully and generally educated. I have not arrived at these conclusions, without giving those matters much consideration. I know too well that farmers, above all other classes of men, have an antipathy to change, and object to innovation, and that there is no means of removing their prejudices, but by education, which would enable them to examine thoroughly the changes that would be recommended to their notice, and look steadily at all the bearings of questions that would effect their interests. They would then, from conviction of their own minds, adopt with alacrity all measures that would be likely to augment the means of happiness of themselves, and their families. It is then that the natural fertility of this fine country would be taken full advantage of, the fields would be well cultivated, and yield abundant crops: the flocks and herds would be judiciously chosen, well managed and fed; good and ample means of internal communication would be provided. All matters in any way connected with agriculture, would clearly exhibit the industry, the skill, and intelligence of those engaged in husbandry, and raise the yeomanry of these Provinces to that high station they are entitled to occupy in this community. If education can produce these results, and no doubt it would, how highly should it be desired and prized by those engaged in agriculture.

It is true, that agriculture may be practiced by *imitation*, without any knowledge of its theory; but in this case it will generally remain stationary. The mere routine practitioner cannot advance beyond the limits of his own particular experience, and can never derive instruction from such accidents as are favorable to his object, nor guard against the recurrence of such as are unfavorable. He can have no recourse for unforseen events, but ordinary expedients; while the educated man of science resorts to general principles, refers events to their true causes, and adopts his measures to meet each case.

According to "Paley," any man who keeps possession of land, is under moral obligation to cultivate it to the best advantage. He expresses himself thus:—"But it has not yet entered into the minds of mankind to reflect, that it is a DUTY to add what we can to the common stock of provisions, by extracting out of our estates the most they will yield; or that it is any *sin* to neglect this." In reference to education, the same excellent writer says:—"In civilized life, every thing is effected by art and skill. Whence a person who is provided with neither (and neither can be acquired without exercise and instruction) will be useless; and he that is useless, will generally be at the same time mischievous to the community, so that to send an uneducated child into the world, is injurious to the rest of mankind; it is little better than to turn out a mad dog or wild beast into the streets." This is strong language, and on this subject, from a High-Churchman, and a man who certainly was of first-rate abilities, should have great weight.—He did not apprehend that education would have a tendency to unfit man for their station in life, whatever it might be.

Dr. Spurzheim said, that those who are versed in history, or understand the law of Christian charity, will join those who contend for the benefit of an instruction adapt-

ed for every class of society, and that whoever thinks it right to cultivate his own mind, cannot with justice desire that others should remain ignorant. Indeed, I would go further and say, that those whose education was provided for in youth, and who are now capable of duly appreciating its benefits, are in *duty bound* to do all in their power to extend the blessings of education to every human being, or at least, to all the uninstructed of the same community of which they are members. I expect to be able to establish the fact clearly, that a *judicious* education will diminish crime, and increase the means of human happiness; and if I am able to do this, it is a matter of the first importance in every country, that the inhabitants be *usefully* and *generally* educated; and *more particularly* the agricultural class, who, I maintain, will receive more certain benefit from an education that is suitable for them, and incur less risk of injury to their habits and usefulness, from this education, than any other numerous class of this community. There is much more danger that some of the educated inhabitants of cities and towns would become idle and useless members of society, than that properly instructed agriculturists should become so. But in any situation, the education that will not be productive of good to the individual, must be defective. "The most enlightened are the most reasonable—the most reasonable feel more than others the real interests and motives they have to be virtuous. Without the study of nature, man can never know the relation he bears, nor the duties he owes to himself ond others—deprived of this knowledge, he can have neither firm principles nor true happiness. The most enlightened, are the most interested in being the best men"—however lamentable it may be, that we do not find them the best in every case. But we shall, among the uneducated class, discover a much greater lack of virtuous principle and true enjoyment, in proportion, than among the properly educated.

Mind was given to man for cultivation, and the means of cultivation is by education and reading. Like the soil of our mother earth, the more *judiciously* it is cultivated, the more abundant good fruits will be produced for the benefit of the individual and of society. There cannot be a more just comparison made, than of an uneducated man, to an ill-cultivated farm; and a *usefully* educated man, to a judiciously cultivated farm. In the first, the natural product, whether good or bad, is allowed to keep possession to a certain extent, both in the mind and in the soil, and the general product of what is useful must necessarily be scanty. In the last, on the contrary, no plants in the field, or ideas in the mind, are suffered to remain or take root, but such as are useful to man, and these are carefully cultivated, and the produce of *good fruits* are most abundant.

If these results do not always follow, it will be from the intervention of accidental circumstances, and will not prove the general principles to be incorrect. There may be many defects in the mode and extent of education. So far as the education at public schools, it is not, in my humble judgment, necessary that a young farmer's education should be carried further than would be practically useful—but it ought not to stop short of this point. A judicious cultivation of the mind is necessary and proper for the agriculturist; but, to proceed further, will, in most cases, be neither convenient nor profitable, more than it would be to expend much money and labor in over-cultivating a farm that would not yield adequate returns, and which is a very possible case. I shall refer to this subject in a future number.

It is a great mistake to compare the agricultural classes in British America generally to what are termed the *peasantry* of other countries, who are mostly persons that have little or no property, more than what they receive for their daily labor, or those who occupy a few acres of land as tenants, paying a high rent for it. On the contrary, the rural population in these Provinces are *proprietors* of ample farms, stock, implements of husbandry, &c. &c. There can be no question of the necessity that exists, that persons circumstanced as the latter class, should receive a suitable education. They cannot exercise their profession to due advantage without being thus qualified; and the loss to this country that is occasioned by the absence of a judicious system of agriculture, and a consequent scanty produce, is enormous.

In the British Isles, within the last fifty years, the produce obtained from agriculture has been greatly increased, and this is to be attributed solely to the improved cultivation and management of soil and stock introduced by educated men. The state of property in those countries will insure the advance of improvement in agriculture, though it should not be through the suggestion of the occupying rent-paying farmer. It will be the interest of the great landed proprietors to proceed with experiments on land and stock, so as to make them as profitable as possible, in order to maintain the rent of lands, &c. on which their annual income chiefly depends. It is not so in British America, the farmers being the *proprietors* of the soil they occupy, they must rely upon themselves for its judicious cultivation. It is for them to judge whether they are competent to do this without receiving a useful and practical education.

To any one acquainted with the real circumstances of the Irish poor, (and the Report of the Poor Commissioners made lately to the British Government, will explain their true state,) it would not be matter of surprise that these wretchedly poor people should be uneducated; but I have known in Ireland, poor men who worked for a miserable daily wages, and who could not obtain one pound of butcher's meat for their family in six months, endeavor to pay a few pence monthly for their children at a country school. They felt their own wretched condition, and expected by giving their children education, which they had not themselves the benefit of, that they might be able to make some improvement in their condition. I admit that the children were not much benefitted by these schools, because they seldom had properly qualified masters, and no good general system of education established for the country population up to the time I left. I introduce the circumstance, however, to show that these poor people were willing to deprive themselves of a part of what was necessary to support existence, in order to give education to their children, when they had no more to give them. They were incapable of judging whether their children were educated in such a way as to make it useful to them in after life, and hence it happened, that in most cases the actual benefit was trifling, for the want of proper superintendance and encouragement. In that country, beyond all other countries in Europe, the poor population were most egregiously mis-managed, and poverty and suffering to an appalling extent, has been the consequence for centuries, and continues up to the present day.

It might be expected that the example of well-managed farms, of which there are several in this country, would be productive of much good. There are many causes which prevent this. As I before observed, strong prejudice exists among farmers, against new modes of cultivation and management of stock, that will not be readily got over, unless by the diffusion of useful education. It is this that will enable the farmer to introduce those prudent changes that will be profitable, and will not allow him to expend labor that is not necessary on cultivation, or capital, on what may be showy rather than profitable.

If a man of capital should occupy land and farm it, more for amusement than profit—he may improve the soil to the highest possible extent, produce abundant crops, and have fine stock. But his neighbors who observe his progress, should they have good cause to imagine that the expenditure exceeds the returns obtained, will receive no benefit from such examples.

What may be considered by some to be the most improved system of agricultural management, cannot be introduced in British America, unless it may be made profitable. I confess I cannot look upon any system of Agricultural Management in tillage or stock as entitled to the term "*improved*," unless it produce *actual profit* to the farmer. Expenditure of capital or labor in any way, that will not give proportionate returns, must be injurious to the community, as well as to the individual who expends it. By *practically* and *usefully* educating the farmer, he will be able to determine for *himself* the course he ought to adopt, in the conduct of every part of his business. In vain was all that has been written and published for the improvement of husbandry, if farmers cannot and will not read. The manners and customs of other countries are unknown to him. The wonders and beauties which abound in the world, are of little consequence to the man who cannot make himself acquainted with descriptions that are given of them, and that would place them as if viewed in a glass before him. The usefulness and enjoyment of those so circumstanced, must,

indeed, be confined within narrow bounds. It is those who have the good fortune to be educated, that will know that education is an essential element of the usefulness of man, to those around him, to the world, and to his own enjoyment.

WILLIAM EVANS.

Cote St. Paul, Jan. 4, 1837.

From the Farmer and Gardener.

THE FARMING INTERESTS, AND THE SURPLUS REVENUE.

As this is the period when our respective State Legislatures are generally in session, the occasion seems peculiarly proper to call the attention of those bodies to the propriety of adopting in each of the several States a law for the promotion of the interests of the agricultural community. The gross sum coming into the State treasuries, collectively is about forty-six millions of dollars, which will give to each member of the confederacy a very handsome addition to their respective revenues—and as this surplus has been in a very great degree collected from the agriculturists of the country, they being the largest portion of the consumers—it is but proper that the State governments in appropriating it to objects of State use, should recollect that the worthy class of society we have alluded to, should not be overlooked. In the old States, this is more especially proper, because from the condition of the lands in many portions of them—worn-out by a long-continued course of exhausting cropping as they are—their proprietors need some stimulus to animate and encourage them to adopt a different and meliorating system of husbandry

We may possibly be met in the onset by the question:—Shall government be called upon to pay men for attending to their own interests?—but to this question we have a ready answer. We wish no such thing: what we desire is this. We want the several States to lay the ground-work of State agricultural prosperity: we want them to grant such annual appropriations, from the funds which will be coming into their respective coffers from the surplus revenue, as will be sufficient, to establish in each State:—

1*st.* A *pattern farm*, at which there should be employed a good practical farmer, sufficiently enlightened to avail himself of all the new lights and improvements in husbandry.

At which experiments should be made of the relative value of the various kinds of manure; of the quantity proper to be used; of the respective durability of each kind; and the peculiar adaption of each to particular soils.

Experiments should also be made of the several kinds of farming implements, and the relative degrees of their usefulness tested.

Experiments should be made in the feeding of stock, so as to establish, upon *data* to be relied on, the cheapest and most economical method of feeding, whether regard be had to beasts of burthens, to the fattening of animals, or to the productions of the dairy.

On this pattern farm, there should be established Mulberry and Sugar Beet plantations. These should be conducted on scale sufficiently large to test the practicability not only of each culture, but of the making of *silk* from the cocoons, and *sugar* from the beets.

Both these branches of husbandry are, in our estimation, of deep concern to the country, whether we consider them with regard to profit or to their moral and physical influences upon the country. It is known that, owing to a long course of impoverishing culture, a very large portion of the land in the old States is in that condition of utter poverty as almost to deny to the husbandman even the *hope* of remuneration. To bring such a land into a state of fertility, it is equally well known, will require the expenditure of such means and the pursuit for some years of a judicious system of rotation of crops, if the ordinary objects of culture are adhered to. But by devoting a portion of each farm to the Mulberry culture, to that amount will the agriculturist be relieved from all expense for improving the soil, as it is a well established fact, that the poorest lands in Italy and France yield the best and most beautiful silk, its elasticity and lustre being infinitely superior to that which grows in rich ground. Here then is an object of the very first moment to the country at large, and more especially to those whose misfortune it may be to be the owners of worn out land, because every acre of the poorest soil, which may be appropriated to the mulberry culture, will be found, after the fourth year, to yield more clear profit than four times its quantity of the most fertile land which may be cultivated in the ordinary branches of husbandry now pursued. Indeed, we have satisfied ourself, after a full and candid investigation of the subject, that above five hundred dollars of nett profit, per year, may be realized from an acre in the mulberry culture, if the business be pursued with intelligence and energy. If this profit be so large, it may be asked, Why do not agriculturists adopt it at once? Why should they need any stronger stimulus than their interest? To the first question we answer, that many of our most intelligent and enterprising farmers are entering into it; and to the second, it may be replied, that when men become wedded through a long course of years to any particular habits, or modes of doing business, it is a difficult task to throw either aside. Besides, it is equally difficult to get those who for half a century have been reaping from six to twenty dollars an acre, to adopt the belief that above five handred dollars can be realized from the same quantity of ground. But if *practical results* be present, to illustrate the truth of the assertion, then, indeed, would they prove perverse, if they did not make the effort to improve their condition. Reasoning thus, our mind comes to the conclusion, that as the wealth of every State, consists in the aggregate of the individual wealth of its citizens—that as its honor, fame and renown are the offsprings of the physical, moral and intellectual capabilities of her people—we say we come to the conclusion, that it is the business of the State to foster and protect all such branches of industry as promise to advance the prosperity and welfare of its citizens, and when so important a one as that which we now advocate can be promoted at so inconsiderable a cost, we say that the duty of extending protection becomes imperiously necessary and proper. Let us suppose, for instance, that at this pattern farm ten acres only should be set apart for the mulberry culture; these ten acres alone, after four years, would yield the State a very handsome interest for the whole outlay, besides demonstrating to the satisfaction of all, the practicability and profitableness of this department of agricultural industry, and the same qnantity of land appropriated to the *Sugar Beet* culture would be sufficient to test its advantages.

2*dly.* There should be established in some central location in each State an *Agricultural* school—say that it shall be attached to the pattern farm, and form a part of it. At this school a course of lectures should be delivered, in which the application of chemistry to the purposes of agriculture should be shown; the principles of agricultural science generally should be taught and enforced. Each county should be entitled to send a given number of scholars to the school and farm, who, as a consideration for the advantages derived at the institution, at the intervals when they were not attending to their duties at the lectures, should perform the work on the farm,—forming then, as they would, the laboring force of the institution, they would derive both practical and theoretical knowledge, and thus become acquainted with every part of the duties of an agriculturist, and be enabled when they returned to their respective homes to prosecute their labors with enlightened economy.—From the best calculations we have been enabled to make, we believe that if the mulberry plantation should be increased to 30 or 40 acres, it would, after the interval named, more than support the whole establishment. How incalculable would be the advantages to be derived from an institution of the kind, placed in the centre of a State, sending forth its hundreds of youth every year to all parts, well skilled in all the knowledge, embued in the science of, and possessing a practical acquaintance with, every branch of the business of the husbandman.

3*dly.* The States should, severally, annually appropriate a sufficient amount of money to be expended under the direction of a General Agricultural State Society, in premiums, embracing those objects thought best calculated to advance the interests of agriculture. Such an appropriation would eminently tend to urge the husbandman onward in the course of improvement, and while, from the smallness of the sums requisite for this purpose, they would not be felt as burthens upon the State treasuries, it would add to the wealth of the several States; for there is no greater truth, than that every improvement made in the capabilities of a soil to produce, increases the aggregate wealth of State.

An appropriation for similar purposes should be made to each county, with a view of organizing County Agricultural Societies, who should form component parts of the General State Society. With the details of those Societies it is not our purpose to meddle; but would urge the propriety of their being established, from a consciousness that the interests of agriculture, the good of the country, and individual welfare, would be promoted thereby. If we cast our eyes to the Eastward, where almost every county

has its *association*, its *fair*, or each its *exhibition*—where the farmers from all parts of each county meet together, become acquainted with each other, exchange their views, impart and receive information—if we look there, and see the influence which similar institutions have exerted, we cannot for a moment doubt the utility of this branch of our recommendation.

In Massachusetts, the Legislature with a view of encouraging the formation of Agricultural Societies, have passed a law which authorises the treasurer to advance to such societies, a sum equal in amount to what may be raised by the individual contributions of their members. This munificence of the State has already exercised a most wholesome and salutary effect throughout all parts of the State. Let us suppose that similar appropriations were to be made in each of the other States of the union—would not the same benefits arise? Would not a spirit of improvement be infused into every section of our country? Most certainly such would be the effect of the paternal care we desire to see extended to the great community of American Agriculturists.

Before we conclude we would remark, that we have no selfish or contracted views to be answered in what we recommend, and while we make these suggestions with a view of benefiting agriculturists, we should be happy to see liberal appropriations made for the purposes of *General Education*, and objects of *internal improvement*; for we hold it that, without the blessings of education are diffused through our land, liberty itself will have but an indifferent tenure on which to rest its hopes for perpetuity,—and while we would cheerfully lend our aid in the building up of a system which should carry the schoolmaster into every neighborhood, we are equally desirous of furthering the construction and completion of railroads and canals, believing that every dollar thus judiciously laid out, adds to the individual and public wealth of a State.

From the Farmers' Register.

DOUBTS OF THE VALUE OF SOME OF THE OPINIONS NOW CURRENT ON AGRICULTURAL IMPROVEMENTS.

———— ————, December 16, 1836.

Sir,—In a desultory course of reading, I remember a long time since, to have met with a passage, in regard, I think, to Socrates, or if not him, some other of the sages of Greece, who being appealed to by his disciples on a disputation between them about "*the sovereign good*," (for in those days they had their favorite abstractions as we have ours,) answered their inquiry by another, "*good for what?*" Though I do not remember in what book I met with the passage, it has often occurred to me as applicable to a multitude of controversies that are carried on in our time, each of the disputants contending for some abstract doctrine, which in itself, is neither right nor wrong, true nor false, but may be the one or the other, according to circumstances. It would be an improper use of your columns, to illustrate this position by examples taken from other pursuits, but it may not be amiss to give some relating to husbandry, and I think, the question of Socrates, "good for what?" not inapplicable to several of your correspondents, who have recommended different applications of agricultural skill and labor, because they have succeeded in other countries, or with particular individuals here, or have taken sides as to the preference of one mode of husbandry to another, not with reference to circumstances, but in the abstract. I could refer to a large number of instances among the communications published in your Register, but will mention only a few; perhaps, you and your readers may justly think them more than enough.

The culture of silk was a favorite object of attention in Virginia, Georgia, and other parts of our country, at a very early period. The project seems to have been lost sight of for very many years, until lately, when it has been revived with increased ardor, to the north as well as the south, and has occupied no inconsiderable space in your columns. In the numerous publications on the subject that I have looked over, I do not remember to have met with one word of discouragement. I should not feel disposed, were it in my power, to discourage it altogether; but all will agree, that the difficulties attending it, if any, should be fairly stated, and that those who engage in it, should be enabled to act "*understandingly*."

Having paid some attention to this matter, I will give you the result of my inquiries, and certainly have no wish that my opinions should pass for more than they may be found to be worth.

From all that I have been able to learn, the silk culture has never been carried on extensively and with success in climates where the cold of winter is long or severe, or in countries that are not well peopled.—In China, the breeding of silk worms, and the manufacture of silk, have been carried on for thousands of years, and at this time, employ a considerable part of the crowded population of that immense empire. It has long since been observed, and I believe, is undoubtedly true, that no two distinct countries, in the same parallels of latitude, resemble each other more in climate, than China and the United States.—In turning over the pages of Staunton, Barrow, and other travellers in China, I was struck with the circumstance, that in going from north to south, they did not find the cotton plant an object of cultivation, till they came to about latitude 38, and then only on a small scale, till they had gone some distance further south; showing a striking coincidence, in this respect, between that climate and ours.—The culture of silk, does not seem to have extended so far to the north, by several degrees of latitude. In France, from all I can learn, and I have taken some pains in the inquiry, it is not extended further north than the banks of the Loire, though it has been attempted in Normandy, and other more northern parts of that country. In Italy, it is carried on as well in the extensive valley of the Po, as south of the Appenines; but this fertile region is fenced from wintry blasts by the lofty ramparts of the Alps, for its whole length from east to west, and its climate is much more temperate in winter than ours, and the length of summer greater.

If a mild temperature were the only requisite to preserve the life of the worm, this object might be attained by artificial means, and with due attention, the proper warmth of the apartment in which they were hatched, might be maintained through the cold season, at the proper point, though not without much care and cost; but the worm cannot exist without food as well as warmth, and a constant supply of green leaves is absolutely necessary for its sustenance.—Although attempts have been made to substitute other vegetables, I believe none have been found to succeed on a large scale but the mulberry; some varieties of which are said to be much preferable to others. The mulberry being a deciduous tree, can afford no supply of food during the cold season, as indeed, is the case with all other trees or plants, that have been recommended as substitutes. It is true, that the insect while in the egg, or in the chrysalis state, does not consume any, and it may be possible to preserve the eggs unhatched during the winter in a northern climate, and indeed, it must be so to a certain degree, or the culture of silk would fail entirely in Connecticut. But on the other hand, its want of success in a sufficient degree to make it an object in the south of Germany, the climate of which is not much colder than ours—in England, where it is milder, and this with the advantage of direct encouragement from the public authorities, by high premiums, &c., and in the more northern part of France, while it succeeds further south—leads to a strong, I may say a necessary presumption, that silk cannot be produced as a general object of cultivation in the northern States, or even so far north as Virginia. You will readily suppose that these views are not original. If they were, their value would be less. They are the result of information that I have collected from various respectable sources, and among others, from Young's *Travels in France*, a work of great and acknowledged merit, which is probably in your possession, or within your reach. If not, you may find it reprinted in Pinkerton's Voyages, &c., published by subscription in Philadelphia, about 1811, in six quarto volumes, of which there are many copies in the country. In chapter 23rd, "*Of the culture of silk in France*," Pinkinton, vol. 4, p. 569 to 580, are notes on the cultivation of silk in different localities, generally in the south of France. The whole might take up too much space in your Register, but if you can find room for the passage "*on Normandy*," in pages 571, 572, and for the latter part of the chapter beginning at page 577, "*Languedoc*," &c., both you and your readers will find a detail of it in facts, I doubt not, an accurate one, relating to this question, and a course of clear and forcible argument that will deserve your consideration, and I think, satisfy you, that silk can never become an object of general cultivation in Virginia. For myself, I am fully persua-

ded, that it would never answer on a large scale in our climate, even if the wages of labor were not so high as they now are, or are likely to be, for generations to come. Still, it is probable, that in one state of society, there are members of a large class of our population that might be employed in this way, without loss to the community, and with some advantage to themselves.

Throughout the continent of Europe, except some of the richer countries, such as Holland, a large proportion of the whole population is occupied in the culture of the soil. This is more or less the case in different parts of Ireland and Scotland, but not in England. On the other hand, great numbers of females are engaged in English manufactures. In this country, much field labor is performed by female slaves, but it is unknown to white females from north to south. The wonderfully rapid increase of our population, necessarily furnishes occupation to a great proportion of them, but there are many of the middling and poorer classes that want employment, while their male connections are laboriously engaged in providing the means of support for themselves and their families. It is true, that a number of families are employed in manufactories, but they bear a very small proportion to the whole, and we must take into account the comparative cheapness of manufactures produced by machinery, which has greatly diminished the amount of domestic manufactures, so that on the whole, there are not near so many females employed in this way as formerly.

It is neither to be expected nor desired, that the wives and daughters of our more independent classes of industrious men, who draw good incomes from their talents and application to business, should lead a life of toil; but if some new and useful employment suited to females in more limited circumstances, could be found for the numbers among them whose time is not taken up by domestic concerns, it would add much to their real comfort, and indeed, be a public benefit, greater, I think, in the northern States, but not to be disregarded in the southern. None occurs to me, at present, as being likely to answer this purpose better, than the culture of silk, though, I believe, the profit would be very moderate indeed—still it would be preferable to idleness. Occupation they must have, and the manufacture of domestic silks, is certainly better suited to them, than the wearing of foreign, in visits or excursions more or less expensive, far or near. It is but justice to add my belief, that it is not their fault that they cannot, at all times, find useful and suitable employment.

These remarks having been drawn out to a much greater length than I had thought of, when I began them, it might be better to stop here; but I will venture to add a few words on a topic which is thought a very important one, by many improving farmers throughout the United States—the improvement of our stock of cattle, by importations from the best English breeds.—It certainly deserves attention, but is, perhaps, of less consequence in our southern grain and tobacco country, than further north, or among our mountains. Large sums have been expended in the importation of English cattle, and handsome profits have been realized by sales of their produce. The preference, I believe, has settled down in favor of the Durham short-horns; the bulls of that stock, commanding the highest prices in England. Much has been urged in their favor, in print and in conversation, and they are always mentioned as being emphatically a good breed; but the question, "*good for what?*" seems never to have occurred among us in regard to them. Most, if not all English writers on the subject speak highly of them, and among others, the last and probably the best work, the *Treatise on Cattle*, published under the direction of the Society for the diffusion of Useful Knowledge—but never in the abstract. They seem not to have gained a footing in the highlands of Scotland, the mountains of Wales, or the less fertile lands of these countries, nor indeed of England. On fertile soils, where cattle are reared as well as fattened for beef, I believe they are pretty generally preferred; but the very extensive rich pastures that are devoted to the fattening of cattle only, are most commonly stocked by smaller and cheaper breeds drawn from Scotland, Wales, and those districts in England, where the pastures being thinner, are better adapted to breeding, than fattening.

The Durham short-horns grow to a large size in a short time, fatten kindly, and yield more milk than most other breeds, though it is admitted to be rather thin in quality; but the small proportion of bone to flesh, an advantage with the butcher, renders them too heavy and inactive for the yoke. I have heard it asserted that they thrive on our pastures, but think this must be a mistake. Like other animals, they must require food in proportion to their bulk, and a large short-horned ox or cow, toiling through a hot day, over a wide extent of thin pasture grounds, for a scanty supply of indifferent grass, would sadly disappoint any sanguine expectations from them. To pasture them on the single crop of clover admitted into our scourging rotation of grain crops in rapid succession, would be contrary to one of our canons of agriculture, and I believe, you and your correspondents will generally agree, would within a short period, reduce a soil not highly fertile to a *caput mortuum*.

Experience and observation have long since shown, that the native breed of cattle in every country, are accommodated *in size*, to the climate and supply of food.—Those of our lower country, though very small, are often remarkably well formed; and by careful selection, and a better supply of food, in winter as well as summer, we might in time obtain a native breed, little, if at all inferior for our purposes, to any we could get from Europe. You will not understand me as objecting wholly to this favorite English race. In various parts of the United States there are rich pastures to which they may be very well suited, and even among us, a slight infusion of blood from cattle so handsomely formed, might add something to the beauty of our stock, and at all events, lead us into the habit of bestowing on them, and by degrees on our native breed, more care and attention than unfortunately it receives from us at present.

Permit me to add a "*few more last words*," on the question, "good for what?" as applicable to a very important object of our husbandry. The four-shift rotation, of two crops of wheat, a crop of corn, and one of clover, in four years, has not only been recommended by the example of some of our most successful cultivators of rich soils, but is proposed as a model for general imitation. With good cultivation, and good management of manures, &c., it may succeed on such lands—but if applied through the whole, or even the greater part of our wheat lands of a medium quality, both the crops and soil would be in a rapid course of decline. Indeed, I am by no means sure that this process is not going on at this time, on a very large proportion of our wheat soils. That this grain is generally put in, harvested, and prepared for market, better than formerly, I have no doubt, and I think it equally clear, that plaster and clover with proper management, tend much to the improvement of soil; but I cannot conceive the possibility of keeping up by this means the fertility of land, not of the first quality, from which three exhausting crops of grain are taken in a four-years' rotation. These crops would reduce the soil faster than the clover and plaster could restore it, and it could only be kept in heart by good supplies of manure, which the land itself could not furnish. This system then, can only succeed in a general way, by setting apart a portion of the land for pasturage, and keeping as good a stock of cattle, as can well be maintained through the winter, and thus providing a good supply of manure. If marl or lime is within reach, the task is much easier: less animal manure will be necessary, though I have no idea that it could be wholly dispensed with, and a larger proportion of the land may be kept under the plough. My objection is not to the four-shift course in itself, but to the attempt, vain and visionary as it seems to me, to carry it on successfully, without plentiful supplies of manure. These can only be obtained by good stocks of cattle; and agreeing with the advocates of the system, that the arable lands should be subjected as little as possible to the tooth and the hoof, the necessity for separate pasture lands seems unquestionable. I do not enter into the question, whether the four-shift system, with these limitations, be preferable to any other: very probably it may, on lands of a good quality. On middling or inferior soils, it might answer by throwing out for pasture a part of the arable lands, and taking pasture grounds into the rotation from time to time; or if the pasture lands are not suited to the place, it might be best to keep the same lands always in rotation of arable crops, or in pasture. Neither the four-shift system nor any other plan of husbandry is good in the abstract. The question always recurs—"*good for what?*"

These remarks are freely submitted to

your consideration and censure, and those of your readers. They are hastily made, though I have reflected maturely on the subjects to which they relate. If they draw no attention, I am content: and if they are thought worthy of any notice, I trust, that though they may not themselves convey any useful information, they may lead to it

With my best wishes for continued success in your useful labors,

I am, respectfully, yours,

——— ———.

From the Farmers' Register.

THE PORTSMOUTH AND ROANOKE RAILWAY THE NAVIGATION OF THE MEHERRIN, NOTTOWAY, AND BLACKWATER RIVERS.

By the Editor.

The Portsmouth and Roanoke Railway route, as far westward as the Meherrin, is remarkably level—and of course the trains are propelled with proportionable facility, and diminished expenditure of power. It is, indeed, an admirable track for its general straightness, no less than its level course. But still there were great causes of difficulty and expense in the first construction, and so will there continue to be in future repairs. The country is low, and the streams passed are bordered by swamps, or low grounds, which required long bridges elevated on sustaining posts and framed timbers. All these bridges remain uncovered, except the one across the Blackwater, and of course their decay will be rapid, and very costly repairs will soon be necessary. After passing the Meherrin, the route is quite undulating, and generally ascending to where it crosses the Petersburg railway, less than two miles from the southern termination of the latter, at Blakely on the Roanoke.

I took my seat in the train at Suffolk, for the intersection near the Roanoke, there to take the Petersburg train, as the shortest way to reach the latter town. And circuitous as is the whole route thus passed over, I travelled the 118 miles from Suffolk to Petersburg in 9 hours—including all the stoppages, except one, of half an hour, between leaving the Portsmouth train and the arrival of the one from Petersburg. If the two companies would agree in their hours of arrival and departure, so as to permit such a journey always on stated days, (as might be done without inconvenience,) and the arrangement was made known, there would be many persons who would come by the two railways from Norfolk to Petersburg, rather than wait one, and sometimes two days, for a passage by the steamboats.

Both these two great railways cross the Meherrin and Nottoway rivers below their falls, and the Portsmouth road also crosses the Blackwater river—and this last, and that only below the railway, is alone made any use of for navigation to bring country produce to be put on the railway, for market. And it is probable that no such use would have been made of the Blackwater, for boats bringing crops made in the neighborhood, but for their being shown the way, by this being made a regular steamboat route from Edenton, and by which much cotton is brought from North Carolina, to be sent by the railway to Norfolk. The almost total disuse of these three easily navigated rivers, is one of the most remarkable instances of the inveteracy of long established habits in our countrymen, and the slowness with which they adopt improved facilities, when offered to their acceptance. These three rivers, though small, flow over very level beds, and would require but little labor and expense to be made navigable for flat boats for distances which combined, would make at least 120 miles, without including the Chowan, formed by the junction of the Meherrin and Nottoway, which is now used for navigation. The length of the Meherrin, from the lowest falls to where it unites with the Nottoway, to form the Chowan, is more than 50 miles, as measured on the map. The Nottoway, from the lower falls above the Petersburg railway, to the point of junction just named, is more than 40 miles—and the Blackwater from the southern line of Surry county, to where that river joins the Nottoway, is 30 miles.

From above the Petersburg railway, there are no falls or rocks, in either the Meherrin or Nottoway—nor, indeed, any obstruction to downward navigation, except trees fallen by accident, or more generally by design, into the streams, and which, if sawed into pieces at low water, woud all be swept away, together with the rafts and sand bars which they have served to form, by the first freshet. It is true, that these streams are very low in summer droughts: but the crops of the country (cotton and corn,) are seldom ready for market before the streams are full—and the timber which this navigation would bring into use, and make valuable for market, might wait until the water was sufficiently deep for its transportion. The Nottoway lands are among the most productive in the counties of Sussex and Southampton—and its passing through the heaviest producing region, is another reason why this river should be used for navigation.—But because these waters led to no suitable market before, and because every farmer has always been in the habit of sending his crops to market by his carts or wagon, no one thinks yet, of taking the far cheaper way of boats to either of the railways.—Meherrin and Nottoway might doubtless be profitably improved and navigated far above their falls, as routes to the upper railway: but it would be idle to urge *that*, while the advantages offered by their far better waters below the falls are overlooked, and almost totally neglected.

It has been a long time since the attention of the writer of these remarks was attracted to the peculiar circumstances of these waters, and the advantages that might be derived from bringing them into use. To induce others more interested, and having more local information, to think upon that and other kindred subjects, the subjoined "Hints and Queries," were published in 1825; which may now furnish some amusement, if nothing more, by the strong contrast displayed of the condition of things, and of prospects, then and now. If the reader, at this time, should condemn the scheme then proposed for bringing these natural canals into use, as altogether absurd, and ridiculous, (as it certainly would have been, if the present state of improvement could have been anticipated,) let it be remembered, that at that time no one had thought of constructing railroads in this region—nor establishing the now prosperous cotton and other factories, which will be so increased in time, as to require as much of the water of the Appomattox, as then ran in waste down the falls. For these two great improvements, the country owes much to the enterprising spirit of Petersburg—and to the fortunate results of these bold but judicious adventures, Petersburg owes her present and fast growing prosperity, which stand in such marked contrast to the state of decline which seemed progressive as late as when this piece was published. But the writer was not more in the dark then, as to the near approaching revival of the prosperity of Petersburg, from the railway and the factories then not planned, than he was in supposing that furnishing a proper outlet to the three rivers would bring them into use. They have now better outlets than he then supposed possible to obtain—being intersected, in five different places, by railroads furnishing speedy and cheap conveyance to two different market towns: and yet these rivers are almost as little used now, as before the construction of these great works.

From the Farmers' Register.

ON THE ORIGIN AND HABITS OF THE CUT-WORM.

Dear Sir:—In resuming so early, the subject of "Entomology," after the long discourse I lately gave you, on the "Hessian Fly"—and, moreover, laboring under the misfortune in the former, as well as the present instance, of controverting, if not *catholic* opinions, at least such as are confidently asserted—I fear you will view me in the light of a *polemical heretic*, delighting more to shake the faith of others, than to establish one for myself.

But, to the point—my subject, at present, is the far famed "Cut-Worm."

In your present, November No., of the "Farmers' Register," I this moment read an extract from the "Cultivator," which, indeed, I have seen *in extenso*, in this inestimable "periodical," in regard to the origin of that destructive insect.

The writer commences his hypothetical remarks, by which, he flatters himself, he has arrived at the truth, by asking the question, "to what species, can they be attributed?" He, then, satisfies himself they are not propagated by the "Coleopterous tribe, (beetle,) because he has examined *several* species of this tribe, and has invariably found their larvæ, of pale yellowish or light brown color: whereas the cut-worm, he adds, is nearly black, and very *different* in its *habits*."—Upon these vague grounds, and this course of reasoning, he *concludes* it is the "*cicada*."

This entomologist, though deserving of much credit, for his zeal in a branch of science in the common estimation of minor importance, yet, in reality, of much magnitude, has considerably erred in his mode of inquiry, as well as in his conclusions.

The question is, to what order do they

belong? These may possibly follow the genus, and finally, the species. And these questions can be answered, by means of *experiment* alone.

His method seems thus; "*several* species of beetle have their "larvæ" of pale yellowish and light brown color—whereas these are nearly black." Therefore he concludes, the origin of the "cut-worm" cannot be a "beetle." This argument may be dismissed as a "*non-sequitur*," and needs no further comment. But he adds, "it is very *different in its habits*," from the "coleoptera" order, inasmuch as the "cut-worm is *periodical*," thereby meaning, as subsequently appears, "not annual."

If the "cut-worm" be *periodical*, its *periods* are *woefully short*, as the mortifying experience of the farmers of Maryland, at least, will attest. Annually in a greater or less degree, and often *disastrously*, for may successive years, do these grubs lay waste our corn crops, in numbers manifestly dependent on the peculiarity of the seasons, and other such natural and general causes, favorable to their propagation; and not upon any law of "*periodicity*." But in what does the "cut-worm" differ (as he alleges,) in its *habits*, from the coleopteras? It is the character of this order to *nidify* in the *ground*; and to *subsist* in the "*worm*" state, upon the *roots*, and *succulent parts* of *vegetables*. Does not the "cut-worm" *nidify* and *subsist* in the *same manner*? Undeniably it does.

Insects of this order, also continue in the noxious "worm state," many as long as one two, three, and some genera, as long as four years: ("Vid: Goldsmith's Animated Nature, vol. , title, *Beetle*,") devouring the tender roots, stocks and blades of whatever vegetables they meet with, yet, having their preferences. In fact the *whole habits* of the "coleoptera" family characterize the "cut-worm" with the most remarkable precision; and I will presently show "without argumentative assistance," that the gentleman's *conclusions*, as well as his *premises*, are wholly erroneous.

In a No., of the "Cultivator," also of the present month, an anonymous writer, "A Watervliet Farmer," pronounces the origin of the "cut-worm" to be a "*moth*." His experiments are too small to be relied on—at first made with *one living* "cut-worm," which as he thought produces a "moth-fly;" but he admits "he had a great number of the moth fly in his windows;" these might readily have caused his "moth" crysalis.—Secondly, his "larvæ" produced from his two other "moths," were all, he says, found *dead* when he first discovered them; and from his own narrative, they were too *microscopic*, especially in their lifeless and necessarily contracted condition, to be identified with any degree of certainty.

These gentlemen, without doubt, honestly believe what they have published: the one that he had proved the "cut-worm," to originate from the "cicada," an hemiptera; the other as certainly from the "moth," a lepidoptera: and the learned and indefatigable agriculturist, Judge Peters, of Pa., believed and published them to be the product of the "scarabæus volvens," a "coleoptera;" and I feel a *moral certainty* derived from what I hold to be "*infallible experiment*," that neither the "*cicada*" nor the "*moth*," nor the "*scarabæus volvens*," is the parent of this Gorgon insect.

In consequence of Judge Peters' paper, in which he represents the "scarabæus volvens" (the common tumble bug) to be the parent of the "cut-worm," and which he had, no doubt, taken at second hand—I was induced, (in 1819) shortly after his publication, and without any reasoning on the matter, as to what it *might* be, or what it *should* be, to make experimental demonstration of what its origin *really was*—Vid: American Farmer, vol. 1. p. 124—title "Entomology."

I offer below an extract from the paragraph containing this experiment; simply remarking that I have "since," repeated it with similar results; and I am quite confident that all who will take the trouble to test it will bear witness to its verity.

"To come at the fact, I carried into the corn field a large transparent bottle, which I half-filled with earth—upon this earth I deposited a dozen of the worms, and gave them corn plants to feed upon. In a few weeks they disappeared. I searched the earth and found them "chrysalids" enveloped in balls of earth. A considerable time after I again examined them, and found several of them matured into the imago, or *parent* bug, and extricated from their *envelopes*; others in the state of a soft "pupa," with limbs more or less distinctly formed, in various stages of progression, and exhibiting unequivocal proofs of their origin, and of the impossibility of mistake or deception. These destructive animals belong to the order "coleoptera" of Lynn., having crustaceous elytra, or wing cases, which shut together and form a longitudinal suture down the back. They are about one quarter of an inch long, generally, and of a shining jet black color, very quick and active in their movements; in fact, the same identical bugs that are seen in vast numbers under wheat stacks, and in wheat yards. The brief history of this insect is, that its larva having fed upon the young corn, or other delicate plants, descends into the earth about the depth of four inches, where it assumes its state of "*chaysalis*," in which it continues till about the first of July, and no doubt, a shorter or longer poriod, as the weather may be more or less favorable—when it becomes transformed into the imago or parent, which in autumn deposites its eggs in the field, to undergo a similar series of transitions, which is effected by the heat of the ensuing season.

"The obvious *preventive* is *fall* or *winter ploughing* at such a depth as will turn up, and expose to the frost, the eggs, whereby they must perish."

The above *preventive* was not offered as original, it had before been practiced, perhaps by many, and its effects had fallen short of their hopes; first, by the imperfect method of too *shallow* a *furrow*, and too *wide* a *slice*, whereby the eggs were not sufficiently exposed. Secondly. because the eggs of all insects are, unfortunately, so tenacious of the principle of *vitality*, as to resist a degree of cold incredible to those who have not witnessed the fact: yet having long practised the proposed preventive, I can say in the fullest truth, that when the work was well executed, and a very *mild winter* did not ensue, I have received a full equivalent for the labor.

Finally, I must apologize for subjoining my name contrary to the general custom, "I perceive," of your correspondents.—May I presume to ask what motive can occasion this custom? Certainly an *anonymous* statement of *facts*, or even of *opinions*, carries with it less confidence than one which offers the *responsibility* of a *name*; and with diminished confidence, the purpose is diminished in effect. The name freely tendered, "of a witness to facts," is a considerable assurance of, at least, a *belief* of their truth; he may be deceived, but it is justly said '*humanum est errare*;' and ordinary liberality will not impute to him a wanton misrepresentation of his impression of facts.—Modesty is commendable; but in this custom, there is rather something of the "*mauvaise honte*." As well may a public speaker, or a witness in court, conceal his identity behind a curtain. The *cause*, and the *effect* would seem to be the same. Excuse these remarks and believe me,

Yours respectfully,

JOSEPH F. MUSE.

Cambridge, Md., Nov. 20, 1836.

From the Farmer and Gardener.

We find the following communication marked for our eye in the *Germantown Telegraph*, and as the writer seems to question the fact which we published some weeks since, of 1510 bushels of Ruta Baga having been raised on an acre of ground, we will remark, that although we do not *vouch* for all that appears in our columns, we endeavor so far to exercise the right of censorship as to preclude that which we believe is calculated to lead our agricultural brethren into error.

That the *named quantity* of Ruta Baga, viz: 1510 bushels has, and can again be raised from an acre we have no doubt. It is known to every one acquainted with the culture of this excellent root, that in England, as well as in this country, products equally as large have been repeatedly raised. On a small scale, it appears from the statement of the *Germantown Farmer*, that he raised of the common turnip, planted in drills two feet apart, by 6 inches, at the rate of 500 bushels to the acre. These turnips would have grown equally as well if the rows had been but 12 inches apart, and consequently would have yielded just twice the quantity. And on good ground, well manured with thoroughly rotted dung, rich mou'd, or a compost of cow-dung and ashes, the plants might with advantage have been brought to stand 8 inches apart, that is, the rows eight inches apart, and the plants the same distance, which we think would have given the quantity stated, provided the turnips had been planted in due time, hand hoed, and well protected from weeds. What the precise quantity would be, we, however, leave the "*Germantown Farmer*" to calculate. And should he discover that the yield would be more than the stated quantity, we take it for granted, he would admit that, as the Ruta Baga grows larger, it necessarily must yield more than the common turnip, and especially as from its irregular form, it *measures more*. Those who advocate the drill husbandry for turnips generally recom-

mend that the rows should be one foot apart and the plants the same distance from each other;—now this would give us 43,560 turnips on an acre; and for the information of our Germantown Farmer, we would remark, that we measured and counted a bushel of the turnips raised by us the present season on Friday last, which, owing to being sowed late, and on ground not at all manured, were but of medium size. The bushel contained 45 turnips, which if they had stood a foot apart would give to the acre 968 bushels. Our crop did not yield at this rate; for owing to drought when the seed was sown, there were as many, if not more *bald* than covered places in our patch, and from this cause our yield was not above 250 bushels to the acre: and although but *half that* of the *Germantown Farmer*, and the *third* of the yield of the grower of the Ruta Baga, we rejoice in our heart others had been more successful than ourself; felt no disposition to "question the correctness" of the statements of those who had been more fortunate than we had, and, of course, gave ourself no trouble in speculating, whether a cypher had been added or not, for although we have grown too old to believe all we read, or to give in to every fashionable dogma, or crude notion, that these eventful days are hourly brining forth, we have too much respect for the social duties of man, as well as for the the courtesies of life, to question the averments of our neighbors upon slight grounds believing as we do, that the *questioning* of the veracity of another is one of the most impertinent as well as unpardonable offence, which one man can commit against his fellow creature. *Truth* as we have said upon another occasion, we hold as the basis of every other virtue, and, therefore, hold its opposite in utter abhorrence, and while we shall entertain sufficient respect for ourself to cultivate virtue and despise vice, we shall certainly expect courtesy at the hands of others.

Near Germantown, 8th Dec., 1836.
To the Editor of the Telegraph:—

I have been pleased with the articles on farming and agriculture that you extract and select from various sources; but while we have the good manners to listen to their wonderful stories, let us not forget that we have a right to have a say in the matter too; and I am surprised that our fellow townsmen have not sounded their own trumpets on this subject: let me set them an example, and show that we can raise turnips as well as the Baltimoreans.

On the 17th of August last I dug over two rods of ground on which I had raised early peas and onions, (manuring the part where the peas had stood, but not heavily; the onion land had been manured previous to planting the onions,) and sowed or dibbled the flat blue topped turnip seed in two rows two feet apart and six inches apart in the row. I flat hoed them twice, I believe, afterwards; thinned them out to single plants in due time, and kept them clear of weeds. They grew finely and completely covered the land thick with their tops. I took them in on the 2d of November last, and had more than six bushels of turnips on these two rods of ground. This is at the rate of 500 bushels to the acre for a ten week's crop, but not 1510 bushels certainly. I am inclined to question the correctness of this Baltimorean story; for mine stood as thick as they could well stand on the ground and were quite as large or larger than any Ruta Baga that I have seen in this country. There is a mistake in it to a certainty; for it does not give four square yards of land to each bushel of turnips; and to have them fine they should be grown in rows three feet apart, and a foot apart in the row. This would give twelve turnips in the four square yards, and these must more than fill a bushel, to have 1510 bushels on an acre of land. It looks a little incredible; perhaps a cypher has been tagged to the story; a nothing in itself; but something wonderful when used in union with 151. Soliciting proof and evidence of this astonishing turnip crop.

I am, Sir,
Yours respectfully.
A GERMANTOWN FARMER.

From the New-York Daily Express.

A CHAPTER ON PORK.

CINCINNATI, Dec. 31, 1836.

Some of the items I gave you in my letter of the 9th inst., on the subject of Pork, and particularly on the slaughtering, I had collected sometime since. Having visited the packing and slaughtering houses within the last day or two, I found additions and improvements had been made this year, I was not before aware of. I will therefore give you another letter on *Pork*, and go somewhat into particulars. Less is doing this winter in Pork, than was anticipated during the past summer. It was known that hogs were plenty throughout the country, and it was believed that the prices would consequently be low,—or lower than last year,—but the uncommonly high prices paid last winter, induced the drovers to scour the country and purchase all the hogs they could find, and on driving them to the city, they demanded what our packers thought an exorbitant price—say for hogs weighing 200 to 250 pounds, $7,00 per hundred.,—the consequence was, that the packers generally delined purchasing, and the drovers would not sell for less, so that but few hogs were packed for the first three weeks of the season. In fact, up to this time, only about 50,000 hogs have been slaughtered, whereas two years ago, at the same time, more than 120,000 were slaughtered and packed. Some of our Pork Merchants are not packing at all, others are doing a little, and none to an extent of former years. Hogs, however, remain firm at the prices demanded by the drovers, and sales were made yesterday at $7 25 der hundred pounds, for hogs weighing 250 pounds. The pork season generally lasts about eight or ten weeks—last year it closed in less than eight weeks—in fact, but few hogs were slaughtered after the first of January. *Eighty thousand* was the number packed last winter. (In the publication of my letter of the 9th, by a typographical error, the number is set down at 60,000.) It is supposed that there will not be more packed in the city this winter than last, and about a half of the number of winter before last. Hogs are driven to this market from the interior of Ohio, Indiana and Kentucky. I will now give you the *modus operandi* of slaughtering, which is performed with such expedition at the slaughterting houses of *John W. Coleman, Esq.*, who has made a large fortune at this business. I find, on visiting these houses, which are situated on the north east extremity of the corporation line, and bordering on a small stream called Deer Creek, or, as it would more properly be called at this season of the year, *Bloody Run*, that the number of slaughter houses now amount to *nine*, the largest of which is 160 feet long by 60 wide. The others average 100 feet long by 60 wide. Mr Coleman has also another slaughter house at Covington, on the Kentucky shore, which makes in all, *ten houses*. At *each* of these houses, he has now employed, 36 to 40 men,—making altogether, about *three hundred and eighty men*, to whom he pays $1,25 to $2,00 per day each. Near these houses are *pens* of various sizes, and covering altogether about forty acres of ground—into these pens are driven the different droves of hogs by their respective owners, as they come into the city, preparatory to the operation of slaughtering. These pens hold from 100 to 1000 each. In these slaughtering houses there are large kettles at each end, filled with water, which is kept constantly boiling, and the operation of killing, scalding, dressing, &c., goes on simultaneously at both ends of the several houses—the hogs are hung up in the centre to be dressed, before removing them to another part of the building to cool. Attached to each end of these houses is a small pen, that will hold about 50 to 60 hogs—into these pens the hogs are driven until they are so compact, that the *executioner* walks in on their backs' bearing in his hands a large sledge hammer, with with he "deals death and destruction" all around him. When they are all knocked down they are removed within the building where the knife is passed into the throat. After bleeding they are thrown into the kettle of water (one at a time) and thence, after sufficient scalding, removed to a bench, when the bristles are scraped off by iron scrapers, made expressly for the purpose, and thence hung up, when the "*gutter*," as he is called, passes his knife from one end of the hog to the other, and removes the offal, and completes the dressing; and so scientific have these *surgeons* become, that any one of them can complete the inside dressing, removing all within, washing out, &c., *of three hogs within the minute*—and, as I stated in my letter of the 9th—*each set of men, at each kettle and bench, at either of these houses, will knock down, bleed, scald, remove the bristles, and complete the inside dressing of fifty hogs within the hour*—which would be *one hundred hogs at each house*, or *one thousand* at all the 10 houses, in a SINGLE HOUR. I learn they now work about eight hours per day, and were it necessary—to such perfection has Mr. Coleman brought this science of "hog-killing"—that he could at this time, at his ten houses, slaughter, and have completely dressed and hung up to cool, EIGHT THOUSAND HOGS IN ONE DAY. I will venture to say, there is no place in the world, out of Cincinnati, where this can be done, *and here it* CAN *be done*. In past years, before Mr. Coleman had arrived at such perfection in the art, he has slaughtered, dressed,

and hung up, in *four houses*, and some of them not in double operation, as now—*twenty-seven hundred in a day*—say 8 or 9 hours' work. The same ratio for *ten* houses, would make 6,750. Mr. Coleman has no competition in this line of business, and I am now informed, that the gut lard, soap grease and bristles (which is the only compensation for slaughtering) is worth about 50 cents for each hog—which would amount to *fifty thousand dollars* for slaughtering a hundred thousand hogs. No mean business, this—and all accomplished within 8 or 10 weeks.

When the hogs become cool, they are conveyed on large wagons made expressly for the purpose, to the packing-houses, which are the largest and most splendid warehouses in the city—there they are cut up and packed, the lard rendered and put in kegs, and the hams cured for smoking.

In the winter and spring of 1835, we exported about sixty thousand barrels of pork! and one hundred thousand kegs of lard! Last winter and spring we exported about half that quantity, and the winter and spring of 1837, we may possibly export more than last year, although it is somewhat doubtful. The quality of the hogs this year is better than they were last, and consequently more clear pork will be packed than then. There is so far a good demand for all the new pork and lard; sales have been made, and are now making, at the following prices:—clear pork $22; mess $20; prime $18; lard 12 cents. Two weeks since, sales were made at prices *ten per cent.* lower than these. These prices are higher than this time last year, and it is thought they will be maintained.

In the article of *Hams*, our pork merchants (those who turn their attention to it) furnish better hams than can be found in any other part of the country. I will venture the assertion, that the *sugar-hams* cured by William M. Walker, and Miller & Lee, cannot be surpassed in flavor and goodness of quality, generally, in the United States. I am aware that the Virginia hams are good. I am also aware, that the hams cured in or about Boston are good—very good—and there is a reason for it. The hogs are fed wholly on corn, the meat is solid, and the hogs are generally fat; but still they cannot match the *family hams* put up by Mr. Walker, and Miller & Lee, of this city—*they know how to cure them*—and that is the great secret, and a secret known but to few. Others of our pork merchants cure most excellent hams, and perhaps equal to any. I have not had an opportunity of knowing. One thing is certain, not only the hams but the pork and lard, exported from Cincinnati, stands high in the Southern and Eastern markets.

Having strung out this letter already to too great a length, I will close this chapter on pork. I may refer to the subject again in some future communication.

EXTRACTION OF SUGAR FROM INDIAN CORN; BY M. PALLAS.—The results obtained by M. Pallas are as follows:

The stalk of the corn contains little or no sugar previous to flowering.

At the time of flowering, a small quantity of sugar may be detected.

When the grain is still soft, about 20 or 25 days after flowering, the plant contains abont 1 in 100 of crystallizable sugar.

When the grain is completely ripe, the stalk furnishes two parts in 100 of sugar, and 4 in 100 of rich and good-tasting molasses.

The residue remaining after the extraction of the sugar, may be given for food to cattle, or will serve for the manufacture of wrapping paper which will bring 11 francs for 50 kilogrammes.—[L'Institut, No. 157, 1836.]

From the London Mechanics' Magazine.

So much has been said of Mr. Crosse and his experiments in electricity, that any information of his *modus operandi* will be eagerly received. The following peep into his labratory will be found highly interesting. The grandeur of the scale upon which he operates cannot fail to strike us with wonder.

MR. CROSSE'S GALVANIC AND ELECTRICAL APPARATUS.

In the *Brighton Herald* of Sept. 24, appeared, "An account of Sir Richard Phillips's visit to Andrew Crosse, Esq, of Broomfield, in the Quantock Hills, Somersetsbire, in September, 1836." Passing over a great deal of Sir Richard's preliminary twaddle (who, it will be seen, claims to have anticipated Mr. Crosse), we now lay before our readers his description of the extensive and splendid galvanic and electrical apparatus fitted up by Mr. Crosse, which is exceedingly interesting:—

"On reaching the handsome mansion of Mr. Crosse, I was received with much politeness, and found that I was the first visitor from Bristol. After breakfast, Mr. Crosse conducted me into a large and lofty apartment, built for a music-room, with a capital organ in the gallery; but I could look at nothing but the seven or eight tables which filled the area of the room, covered with extensive Voltoic batteries of all forms, sizes, and extents. They resembled battalions of soldiers in exact rank and file, and seemed innumerable.

"They were in many forms. Some in porcelain troughs of the usual construction; some like the *couronnes des tasses;* others cylindrical; some in pairs of glass vessels, with double metallic cylinders; besides them, others of glass jars, with stripes of copper and zinc. Altogether, there were 500 Voltaic pairs at work in this great room; and in other rooms about 500 more. There were besides another 500 ready for new experiments. It seemed like a great magazine for Voltaic purposes.

"There are also two large workshops, with furnaces, tools, and implements of all descriptions, as much as would load two or three wagons.

"In the great room there is also a very large electrical machine, with a 20 inch cylinder, and a smaller one; and in several cases all the apparatus in perfect condition, as described in the best books on electricity. The prime-conductor stood on glass legs, 2 feet high; and there was a medical discharger on a glass leg of 5 feet. Nothing could be in finer order; and no private electrician in the world could, perhaps, show a greater variety both for experiments and amusement.

"Beneath the mahogany cover of a table, on which stood the prime conductor, &c., was enclosed a magnificent battery of 50 jars, combining 73 square feet of coating. Its construction, by Cuthbertson, was in all respects most perfect. To charge it required 250 vigorous turns of the wheel; and its discharge made a report as loud as a blunderbuss. It fuses and disperses wires of various metals; and the walls of the apartment are covered with framed impressions of the radiations from the explosion, taken at sundry periods. Mr. Crosse struck one while I was present; and he has promised me one as an electrical curiosity, and a memento of my visit.

"But Mr. Crosse's greatest electrical curiosity was his apparatus for measuring, collecting, and operating with atmospheric electricity. He collects it by wires the sixteenth of an inch, extended from elevated poles, or from trees to trees, in his grounds and park. The wires are insulated by means of glass tubes, well contrived for the purpose. At present he has about one-fourth of a mile of wire spread abroad; and in general about one-third of a mile. A French gentleman had reported to the Section at Bristol, that the wires extended 20 miles, filling the entire neighborhood with thunder and lightning, to the great terror of the peasantry, who in consequence left Mr. Crosse in the free enjoyment of his game and rabbits. This exaggeration Mr. Crosse laughed at most heartily, though he acknowledged that he knew that no small terror prevailed in regard to him and his experiments.

"The wires are connected with an apparatus in a window of his organ-gallery, which may be detached at pleasure, when too violent, by simply turning an insulated lever; but in moderate strength it may be conducted to a ball suspended over the great battery, which connected is charged rapidly, and is then discharged by means of an universal discharger. He told me that sometimes the current was so great as to charge and discharge the great battery 20 times in a minute, with reports as loud as cannon; which, being continuous, were so terrible to strangers that they always fled, while every one expected the destruction of himself and premises. He was, however, he said, used to it, and knew how to manage and control it; but when it got into a passion, he coolly, turned his insulating lever, and conducted the lightning into the ground. It was a damp day, and we regretted that our courage could not be put to the test.

"Every thing about this part of Mr. Crosse's apparatus is perfect, and much of it his own contrivance, for he is clever in all mechanical arrangements, and has been unwearied in his application, almost night

and day, for thirty years past. I learned, too, that in the purchase and fitting up of his apparatus he has expended nearly 3000*l.* although in most cases he is his own manipulator, carpenter, smith, coppersmith, &c.

"About 12, Professor Sedgwick arrived, and in the afternoon one or two others, besides seven or eight gentlemen of the neighborhood, who had been invited to meet us at dinner, for Mr. Crosse unites to the rank of esquire that of a county magistrate, in the duties of which he is respected alike for his humanity to the poor and for his liberal opinions in politics. Mr. Crosse himself was educated at Oxford; and his second son holds the living of Broomfield. He is master of all his father's experiments; and, in spite of the complaints of an Oxford education, I found him to be a very expert mathematician, well read, and variously accomplished. We next morning renewed our survey, previous to fresh arrivals, and I took notes of every thing connected with his aqueous Voltaic batteries, in the following order, errors excepted:—

"1. A battery of 100 pairs of 25 square inches, charged, like all the rest, with water, operating on cups containing 1oz. of carbonate of barytes and powdered sulphate of alumine; intended to form sulphate of barytes at the positive pole, and crystals of alumine at the negative.

"2. A battery of 11 cylindrical pairs, 12 inches by 4. This, by operating six months on fluat of silver, had produced large hexahedral crystals at the negative pole, and crystals of silica and chalcedony at the positive.

"3. A battery of 100 pairs, of 4 square inches, operating on slate 832, and platina 3, to produce hexagonal crystals at the positive pole.

"4. A battery of 100 pairs, 5 inches square, operating on nitrate of silver and copper, to produce malachite at the positive pole; at the negative pole crystals already appear with decided angles and facets.

"5. A battery of 16 pairs, of 2 inches in small glass jars, acting on a weak solution of nitrate of silver, and already producing a compact negatation of native silver.

"6. A battery (esteemed his best) of 813 pairs, 5 inches, insulated on glass plates on deal bars, coated with cement, and so slightly oxydated by water as to require cleaning but once or twice a year by pumping on them. I felt the effect of 458 pairs, in careless order and imperfectly liquidated, and they gave only some tinglings of the fingers; but this power in a few weeks produces decided effects.

"7. A battery of 12 pairs, 25 inches zinc and 36 copper, charged two months before with water, and acting on a solution of nitrate of silver, poured on green-bottle glass coarsely powdered. It had already produced a negatation of silver at the positive pole.

"8. A battery of 159 galley-pots, with semi-circular plates of 1¼ inch radius, placed on glass plates, and acting five months through a small piece of Bridgewater porous brick, on a solution of silex and potash. I saw at the poles small crystals of quartz.

"9. A battery of 30 pairs, similar to No. 8, acting since 27th July on a mixture, in a mortor of sulphate of lead, of white oxide of antimony, and sulphate of copper, and green sulphate of iron (205 grains), and three times the whole of green-bottle glass (615 grains). The result has been, in five weeks, a precipitation on the negative wire of pure copper in two days, and crystallised iron pyrites in four days. It had been expected to produce sulphurets of lead, copper, and antimony, by depriving the sulphates of their oxygen. On August 10th and 28th, 25 grains and 40 grains of sulphate of iron were added.

"10. A battery of 5 jars, with plates of different metals, as 2 copper and platina, 1 lead and lead, 1 silver and iron, and 1 copper and lead. Experimental.

"11, 12, and 13. About 200 pairs, in 3 batteries, working in a dark room, of which I took no note.

"While I was an inmate with Mr. Crosse, we had various conversations about the power which he employed. I had in some degree anticipated his *debut*, by hazarding, in the last edition of my 'Million of Facts, (1835), an assertion that, inasmuch as metals are found only in a mixed or confused state of different rocks, among which a galvanic action on air or water would necessarily arise, and in long time generate the compound or matrices of metals; but I did not regard this public anticipation as any interference with his original merits, and I was deeply penetrated by the view of his labors and the expense and zeal with which he had prosecuted his experiments. Yet he had a round conductor for a minimum of power, instead of a combination of flat or parallel ones for a maximum. And he could not help talking about the fluid and some other fancies of the elder electricians, who invented their doctrines before it was suspected that air was a compound, and that such active powers as oxygen, nitrogen, hydrogen, and their definite numerical co-mixtures, conferred mechanical character on the most refined operations of nature.

"He instructed me in the fact, that his batteries performed four times the duty in those hours in the morning, from seven to eleven, when the great laboratory of nature is envolving the most oxygen—than in the same period in the evening, when we may imagine the contrary effect takes place. He considered the air as so non-electric in damp weather, that no plate of air lying between the coating of a cloud and the earth could then be disturbed; and he stated to me, as a general fact, that the earth is always positively electrified.

"On my part, I enlarged to him and his son on the universality of matter and motion in producing all material phenomena, independently of the whimsical powers invented in ages when we would have been burnt for a magician; and in this way I endeavored to return the various information which he had unreservedly imparted to me. I impressed on him, that all this creative energy of atoms was merely a display of developements by the great motions of the earth as they affect the excitable parts of different solid bodies; the results of which are necessarily regular, and their ultimate laws of re-action and combination also regular, so as to produce that universal harmony which surprises beings, who in eternal time live and observe within only a unit of time. Hence that terrestrial galvanism, arising from the operations of the internal frictions and varied pressures called heat; hence those factitious productions of metallic matrices and crystalline galvanic effects, where different substances are proximately opposed; hence magnetism itself, tangentally displayed as a resultant of terrestrial currents of electricity; hence the fluctuations of the phenomena from obliquity of the axis of rotation, which in regard to the axis of the orbit generates two variable directions of massive pressure; hence, in fine, the wisdom displayed by Mr. Crosse in resorting to the *modus operandi* of Nature in his attempts to imitate her most curious productions.

"Observing that continual fresh arrivals rendered it ineligible for me to prolong my visit, I proceeded to Taunton, a distance of six or seven miles, the nearest place at which a stranger can meet with public accommodation."

From the Athenæum.

MEDALLIC ENGRAVING.

The idea of employing machinery for the purpose of engraving upon metals is not of very recent origin: as was the case with steam navigation, the principle was recognized many years before it was put into successful practice. In the year 1830, Mons. A. Collas, an able mechanician at Paris, having been commissioned by an engraver at Ghent to make a ruling machine for him, constructed one for himself, upon a somewhat different principle, with which he made several attempts to execute engravings upon copper, in the style of a pattern which had been published in the *Manuel des Tourneurs* upwards of twenty-four years before. It was not till six months' labor and thought had been bestowed upon it that M. Collas brought his invention to a certain degree of perfection: he produced his first engravings in the spring of 1831. Of the attempts at a similar instrument, made in the United States, we are informed, and believe, that he had seen or heard nothing; but in the year 1833 he chanced to meet at Paris with an old mathematician from Geneva, whose father had, some sixty years before, been employed in executing engravings by machinery upon the cases of gold and silver wathes; so that the remotest traces of this art may be dated about the year 1775 to 1780.

It has been ascertained, beyond all doubt, that this invention is not of domestic growth in England. It was in the year 1817 that a die-sinker of the name of Christian Gobrecht, then living at Philadelphia, produced by a machine an engraving upon copper of a medallic head of the Emperor Alexander of Russia, several impressions of which were distributed in that city. Mr. Asa Spencer (now of the firm Draper, Underwood, and

Co.) took one of Gobrecht's machines with him to London in the year 1819, which was its first introduction into London. This machine was principally designed for straight and waved lines; it was employed in London, and its uses exhibited and explained by Mr. Spencer to several artists. It attracted the particular notice of the late Mr. Turrell, an engineer, and he obtained permission to make a drawing of the machine, for the purpose of having one constructed for his own use. Ten years afterwards, in the year 1829, Mr. Joseph Saxton, an American, born at Huntingdon, in Pennsylvania, who had known Gobercht, and seen the engraving from the Russian medal, contrived a machine somewhat similar in principle to the one brought to England by Mr. Spencer; in this he first introduced a *diagonal tracer*, for the purpose of correcting some of the defects which existed in the medallic engravings executed by Gobrecht's and Spencer's machines; these had all of them an unpleasant twist upwards, and an evident distortion of the features of the head. In the following year, an idea being started of applying this new method to the engraving of designs for bank notes, Mr. Spencer again bestowed considerable pains upon the improvement of his invention, without any success. Mr. Turrell, who was acquainted both with Spencer and with Saxton, communicated his drawing and his ideas upon the subject to Mr. Bawtry, who then held the situation of engraver to the Bank of England, and it was this gentleman who originally applied to Mr. Lacy to construct a machine of this description for him. Mr. Lacy was then, as Mr. Spencer had been, connected with the establishment of Messrs. Perking, Bacon, and Petch, bank note engravers in Fleet street, and was the person employed, in the year 1832, to execute the engraving from a medal representing the bust of our present King, which appeared in the frontispiece of the "Keepsake" for 1833. The contracting parties did not come to a satisfactory agreement, and the negotiation was broken off. It was probably that at time that Mr. Bawtry entered into communication with Mr. John Bate, of the Poultry, optician and maker of mathematical instruments to the Board of Admiralty. Mr. Saxton had been introduced to Mr. Bate shortly after his arrival in England, and had, we believe, given to the latter his first notion of such a machine by exhibiting to him an engraving upon glass, executed by it. During the succeeding interval, Mr. Saxton had continued to attempt the improvement of his diagonal tracer which, though some distortions were manifestly obviated by it, was still utterly unable to give the effect of light and shade when employed to engrave medals of very bold, or, rather, *steep* relief, and inevitably left blank spots in the engravings. Here the matter rested for awhile.

In the earlier part of the year 1832, the Messrs. Bate having been informed that Mr. Saxton had effected several improvements in his machine, had an interview with him, for the purpose of exchanging their ideas upon the subject. But a natural feeling of jealousy prevented either party from exhibiting to the other his machine; the Messrs. Bate stated, indeed, that they had succeeded in removing the distortions which existed in their earlier productions; Mr. Saxton, on the other hand, referred to his own invention, and declared himself capable of executing by his machine as much as they could do by theirs; finally agreeing to satisfy them of the truth of his assertions, by putting into their hands an engraving, in which all distortions should be avoided. This engraving was a head of Franklin, with a bust of Minerva copied from a gem or cameo. Upon examining it the Messrs. Bate, however, seemed to think that some distortions, though slight ones, still remained. It was then proposed that both parties should execute an engraving from a gem representing the head of Ariadne, an impression of which, in wax, Mr. Bate, junior, undertook to send to Mr. Saxton. But here the matter ended—the wax impression was never sent, and two months afterwards Mr. Saxton was informed that Mr. Bate had taken out a patent for an improved machine, particularly specifying the introduction of the diagonal tracer, which happened to be the same as his own. Mr. Saxton, disgusted with the turn which matters had taken, turned his attention to other mechanical inventions, and subsequently sold his machine to Mr. W. Trevylian, in whose hands it now remains. From that period nothing was done in the way of engraving from medals, and no step taken, either by Mr. Bate himself, or his friends, to bring his invention before the public; the invention, as it were, remained dormant in England.

It was towards the close of the year 1832 that M. Collas sold his patent to a few gentlemen, who, with the aid, and under the direction of some of the first French painters, sculptors, and engravers, united themselves in a company, under the firm of Lachovardiere and Co. It is to the enterprising spirit of these gentlemen that we are indebted for the "Tresor Numismatique et de Glyptique" (see *Athenæum*, No. 388, p. 261), which has now reached the extent of 600 plates of medals, bas reliefs, &c., representing upwards of 5000 subjects. This work has been widely circulated in France and throughout the continent: most of its plates, for beauty of effect and artist-like execution, leave the eye nothing to desire. It is needless to remind our readers, that the French company, just mentioned, has for some months been actively bestirring itself, for the purpose of applying the invention of M. Collas to the illustration of our medallic history; and that a petition for the assistance and patronage of government to such a national work was laid before a Committee of the House of Commons during the recent session. These efforts have been met by a determined opposition on the part of certain of our native artists, who have attempted to quench the scheme, by bringing forward Mr. Bate's almost forgotten invention, in proof that the ground was pre-occupied, and by denouncing the French engravings as false, distorted, and mathematically inaccurate. In answer to the first plea, it is enough to state the fact, that nothing was done by Mr. Bate in the way of making his invention popular—no plan thought of, of applying it to a grand national undertaking—till the French company, with a superb work to point to as a specimen of *what their machine had effected*, laid their proposals and petition for Parliament. The second argument, a charge of mechanical inaccuracy brought against the French engravings, will be disposed of with equal ease, though not quite so briefly.

It will be admitted, without hesitation, that the best representation of any subject, as a work of art, is the one which shall convey the most faithful and pleasing impression of its general effect; that, as the said representation is to be judged of by a pair of eyes, and not by a pair of compasses, there are cases wherin the latter may *prove* a mathematical incorrectness, which the former will not acknowledge, and which, therefore, in no respect, impairs the merit of the copy. In examining a medal, *if it be laid flat upon a table*, all the effects of light and shade will disappear, and its bold outlines only strike the eye; whereas, *if it be taken up in the hand*, the relief becomes apparent, and the design is set off with the powerful aid of *chiaro-scuro*. The professed medallist may possibly prefer the first mode, as the best means of obtaining the exact proportions of the work before him; the general amateur and artist will assuredly give preference to the medal as seen in relief, being the more characteristic and pleasing aspect. It is to the faithful rendering of the latter effect, that the attention of the French engravers has principally been directed, at the necessary expense, in some cases, of geometrical exactness. A complaint, therefore, has been raised against their works, as unfaithful—they have been proved guilty of incorrectness, by the compasses, and the harsh word "distortion" has been liberally applied to them. But we are persuaded, that the weight of the objection is merely in the harshness of the word: the result of a careful examination of many specimens laid before us, has convinced us that there is no defect in the works executed by the French machine; there may, indeed, be occasional deficiency, inasmuch as, while the machine cannot give any thing but what is on the medal, it may not, in every instance, give *all* that is there. Granting, then, that the general effect of the medal, when held in the hand (that is, when seen in *chiaro-scuro*,) be faithfully and artistically rendered by the French machine, it is fruitless to *reason* about an imperfection, of which the compasses, and not the eye, are sensible. It should further be insisted upon, that this "incorrectness" with which the works of the French machine have been charged, is not necessary to it, but has been merely sanctioned for the sake of effect by the presiding artists, on the principle just laid down. Besides other engravings of geometrical exactness already produced, a plate is in preparation containing the Soane medal, the head of Henry the Fourth, the Ariadne, and other subjects, by which the proprietors are prepared to prove that the style of execution which they have adopted has been a matter of choice, and not enforced upon him by any defect in the machine.

The universal approbation given to the engravings of the "Tresor" by the artists and amateurs of the continent, who do not undervalue scrupulosity of outline and precision of drawing, may be quoted in support of the line of argument we have adopted: we may also, in confirmation, select a few passages from the evidence given before the

Committee of the House of Commons upon the subject. Sir Francis Chantrey, when asked whether the mathematical inaccuracy objected to "produced an idea of distortion or any disagreeable effect to the eye," answered, that "it never produced any disagreeable effect to his eye, nor was he aware of it till it was pointed out to him;" and, therefore, he considered it of no very essential importance, and expressed his unqualified satisfaction in the engravings produced by the French machine. Mr. Hawkins, of the British Museum, when asked a similar question, gave a similar answer; he said that "a deviation, which is not visible to the eye, is not to be considered as a distortion;" and pronounced M. Collas's method as "giving the best idea of the medal of any method he had seen." Mr. Pistrucci, of the Mint, when examined before the Committee as to the merits of the French and English machines, gave it as his opinion, "that both are very clever, but each of them is deficient in that which makes the chief merit of the other: the French machine is beautiful and admirable for effect, and gives a correct idea of the work; but in a perspective view, or what I may call more appropriately foreshortening, it does not give the objects precisely as we see them, when we look at the centre of a real medal, but in chiaro-scuro, and with much effect. The English one gives it straight as far as I can judge: but I cannot say that it is mathematically correct with the original, not having had the original medal before me to compare it with; and it is possible that there may be a difference in the height, though not in the breadth of the objects rendered; but the engraving is flat and hard, with little or no effect."

We think that the above will suffice to convince our readers that the objections raised against the engravings produced by M. Collas's machine, are frivolous and futile. It is needless for us to repeat once again our opinions with respect to the feasibility and interest of the national work proposed; and if those who have any doubts on the subject, will examine the magnificent engravings of the portrait of Louis Philippe, and the one from the bas-relief of the Canterbury Pilgrimage, we think they will be, like ourselves, fully satisfied that such a work could not be in better hands than those of M. Collas and his enterprising coadjutors. We have now only to describe the specimens:—

No. 1. Innocence prostrating herself before Justice, and entreating her protection; Violence is represented by a warrior holding a naked sword.—Sauvage.

2. Part of the Phygalian Frieze.

3. Cupid and Psyche; from a cameo by Louis Pikler, after a bas-relief by Thorwaldsen.

4. Vulcan forging the shafts of Cupid; from a cameo by Pikler, after a picture by Raffael Mengs.

5. Antigone and Ismena before the Temple of the Furies, urging Œdipus to return to Thebes; from a cameo in onyx by Louis Pikler.

6. The Heads of Augustus and Livia; from an ancient cameo in sardonyx.

7. Hercules stifling the Nemæan Lion; from a sculpture in bronze of the 15th century.*

* With every respect for our esteemed contemporary, we must say, that if the capabilities of M. Collas's machine are to be judged of from the specimens here referred to, its superiority is extremely questionable. The utmost that in our humble opinion, can be fairly said of them as works of art is, that they are striking and curious—considering how they have been produced—not that they are in themselves remarkable either for truth of delineation or excellence of finish. We have seen much better specimens of the art, both English and American.—Ed. M. M.

From the London Mechanics' Magazine.

MANUMOTIVE-CARRIAGES.

We have often wondered that in these inventive days, no one has perfected an apparatus similar in design to the one inquired for in the following communication—Cannot our ingenuity supply this trantsatlantic want?

Sir,—By the extract in your last number from a Dublin paper, we learn that a whitesmith of Enniscorthy is emyloyed, as several other persons at this time are, in constructing a manumotive-carriage. In the present instance the vehicle "is propelled by an iron handle, which the guide moves to and fro with the right hand."

One would think it was almost impossible to hit upon any scheme for this purpose possessing much novelty, so many and so various are the plans that have been tried. When *velocipedes* were so much the rage in London a few years since, much ingenuity was exercised to produce manumotive-carriages in which the softer sex might ride; but without success, and since that time this has been the favorite hobby of many individuals. It is unfortunately a fact, that too many persons are apt to imagine, that the success of their machine depends upon the quantity and complexity of the mechanism employed, and this mistake generally proves fatal to their success.

When discussing this matter in a previous number (635,) I stated that the simplest, and therefore of necessity the best way of constructing manumotive-carriages, was to "fix a spur-wheel on the axle of the propelling-wheels, and drive them by a pinion duly proportioned to the inverse quantities of time and power. The man's labor applied tothe pinion by means of a winch-handle, would produce all the effect to be derived from such a source, and more than could possibly be obtained by any more complicated train of mechanism."

By applying the manual power to two cranks placed on the axle of the pinion, but opposite to each other, working the one with the right hand and the other with the left, the greatest possible effect would be produced. The guiding could easily be managed with the feet. By a machine so formed, favored with all the advantages of the best workmanship, a person might propel himself at a tolerable good speed; but for any great distance, I apprehend it might be walked over in about the same time with less bodily exertion, and therefore with greater ease.

There are cases, however, where persons have not the free use of their legs, while thier arms retain all their wonted vigor; to such parties a machine of this kind would be of infinite service. It is desirable, therefore, to put those persons in the right road who are wishing to construct such a machine.

In the case of Mr. Nicholson, he appears to be adopting the plan, familiar to the inhabitants of this metropolis, from its having been frequently seen in our streets; a carriage was constructed, and propelled at the rate of five or six miles an hour by six men, who each pulled a lever "*to and fro*" with a motion very similar to rowing, which acting upon cranks placed on the axle of the driving-wheels, turned them round and thereby urged the carriage forward. The conversion of rectilinear into circular motion, in this case, is attended with a great waste of power, and the plan I have pointed out would in practice be found more convenient as wellas much more efficient.

There are cases, as I have already stated, in which manumotive vehicles would prove eminently useful; in general, however, to persons in full possession of all their natural powers, the *marrowbone* stage will be the best conveyance.

Yours respectfully,
Wm. Baddeley.

London, Oct. 4, 1836.

PENNSYLVANIA COLLEGE OF MINES.

We perceive that on Tuesday, Mr. Trego, one of our city delegation, gave notice in the House of Representatives, that he should next day ask leave to bring in a bill entitled "An Act for the Establishment of a College of Mines in the State of Pennsylvania."

It is understood that this bill will provide for the erection of an institution in which, in connexion with other useful and practical sciences, will be taught:

1. Geology, Mineralogy and Chemistry, as applicable to agriculture, architecture, the construction of canals and roads, the digging and boring for water, &c.

2. Mineralogical Chemistry, exemplifying theoretically and practically the most approved and economical methods of analyzing ores, earths, soils, mineral waters, &c.

3. The theory and practice of Mining, with reference to the geographical and geological position of the mineral beds and veins, and the discovery and discrimination of minerals in rocks and soils; also, the practice of engineering, as applied to mining.

4. Metallurgy, theoretical and practical, or the art of reducing and smelting ores, and of separating them from foreign matter as well as from one another; also, the mode of making the best combinations and alloys of metals used in the arts.

It is also intended to establish in the said college, a collection of specimens of all the important rock, formations and of all the minerals found in the State, properly and scientifically arranged, with their names and localities; and also a description of their chemical character, composition and their use in the arts. Also a

similar collection of all useful or curious foreign minerals, with their names, uses, &c., together with such information relative to them as will be calculated to lead to their discovery in the State of Pennsylvania.

Instead of an endowment to this college from the State treasury, it is proposed to appropriate, in aid of its funds, the State tax on the dividends of coal and mining companies, and companies for the manufacture of iron, incorporated within this commonwealth which, with the aid of subscriptions and donations from liberal and public spirited citizens, will, it is believed, be amply sufficient for the support of the college.

It is gratifying to us thus to notice the labors of Mr. Trego. Last year he introduced, and, aided by his colleagues, carried through the House, a bill directing a geological and mineralogical survey of the State. The proposed "College of Mines" seems to be most consonant with the capabilities of our State, and if rightly conducted, cannot fail to bring out its immense mineral treasures, and make them contribute to general as well as individual prosperity.—[U. S. Gazette.]

We commend the circular of M. Brongniart, to the especial notice of all interested in the plastic art.

The name of M. Brongniart, will be a guarantee for the proper use of any information that may be transmitted to him.

From Silliman's Journal.

M. ALEXANDRE BRONGNIART'S NEW WORK ON THE HISTORY OF THE ART OF POTTERY AND OF VITRIFICATION.

Museum to illustrate this subject.

In a letter to the editor, dated March 8th, 1836, M. Brongniart remarks: "I am much occupied with a work upon the history of the plastic art, or the art of pottery; and the requests which I take the liberty to annex, have for their object the enriching of a grand and instructive collection which I have formed at Sevres, of every thing relative to the art of pottery, and consequently to the perfection of the work which I have undertaken, and of which I have published the plan in an extract from the article Pottery, in the Dictionary of Technology published at Paris. It forms the half of a volume, in which I have endeavored to present the principles of the art in a manner at once practical, philosophical and elementary. I am this year about taking a journey to England and to Germany, for the purpose of collecting information and specimens for this work and for the collection at Sevres.

As this undertaking of M. Brongniart is important and interesting to science, to history, and to the highly useful and beautiful art of pottery, we publish a translation of the expose entire, and strongly recommend it to the attention of all those who, in this country, have it in their power to promote the object in view. It is quite superfluous to add, that M. Brongniart's character furnishes every security for the able and faithful performance of the duty which he has undertaken.—Ed.

Sevres, March 8th, 1836.

ROYAL MANUFACTORY OF PORCELAIN, AND FOR PAINTING ON GLASS. U. STATES OF AMERICA.

Instructions as to the manner of co-operating towards the completion of the collection relative to the arts, connected with the manufacture of porcelain and with vitrification, founded at the Royal Manufactory at Sevres near Paris.

1. What kinds of pottery are used by the different classes of inhabitants of the country; the agriculturists, the mechanics, citizens and merchants, poor and rich?

Is the pottery of native or foreign manufacture?

If foreign, from what country does it come, and in what way?

If of native manufacture, where is it made?

II. As to the native pottery, (and under this name we include all varieties, from the most common to porcelain,) it is desired to collect and procure specimens of every sort. Common pottery, both with and without glazing. Delftware common and Delftware fine. Pottery of brown free stone; crucibles. Varieties of porcelain. Bricks, both common and those manufactured by particular processes.

Plate species.—Plates, oval dishes.

Hollow ware.—Cups, salad dishes, tea and coffee cups.

Round pots, hollow moulded.—Oval and square pieces, saucers, boxes, &c.

The largest piece of each sort that is made.

The name given in the country to each piece.

The price of each piece upon the spot.

Whether there is exportation, and to what place.

III. FABRICATION.

1. *Primary materials*—for the mass or paste. Clays. Marls or plastic earths which may be substituted for them. Sands. Rocks or stones. Limestone.

For the glaze or enamel.—If stony materials—feldspar-stones.

If metalic matters—Metals, their oxides, and metalic glass.

Exact localities from which these materials are drawn.

2. *Modelling.*—Moulds of plaster, of terra cotta or other materials of whatever kind.

The lathe and other instruments for fabrication.

Sketches, with exact dimensions of these instruments, if it is supposed that they differ from those used in Europe.

3. *Baking.*—Form of the ovens sketched, with the dimensions.

*Combustibles used, indicating them in the clearest manner possible.

IV. Information peculiar to the country.

1. To designate the principal manufactures of pottery, glass and porcelain in your vicinity.

2. Whether there is in North America, ancient pottery; that is to say, pottery fabricated in remote ages, and which has not been made for a long time. This pottery is found in general in alluvial soil, in the ruins of towns, and perhaps, as in some parts of Italy, and of South America, and of the oriental countries of the ancient world, in the graves or tumuli. In Europe, these things have often been admitted into museums as monuments of antiquity, but almost never as in relation to the this of pottery and its history. It is in art latter point of view that I regard them, and that I have collected a great number of the ancient pieces of pottery in the museum at Sevres.

To endeavor to collect some pieces of this antique pottery, and to indicate exactly the place and the circumstances in which they have been found, and to endeavor to decide whether it had anciently any celebrity, always however mistrusting the deception of the sellers.

3. Whether there is knowledge from traditions, inscriptions, &c, that the natives (aborigines) of North America have ever fabricated or known glass.

General instructions in relation to the purchase, packing and forwarding of the objects collected.

The expenses which may be incurred in procuring the specimens and the information, will be reimbursed by the administration of the Royal Manufactory of Porcelain, upon the statement sent to the person who shall be designated to receive the amount.

It is expected that these expenses will not rise to a great amount: it is requested, in any event, that they may not exceed, in any one year, the sum granted, i. e. 200 francs for 1836, ($40); 200 for 1837; at least without a previous understanding with the administrator of the Royal Manufactory at Sevres.

It will be necessary to pack the pieces with great care, and to consign them to a merchant in one of the ports of France, to be forwarded by way of slow transportation to the administrator of the Royal Manufacture of Porcelain; forwarding also the expenses of transportation.

It will be necessary that the correspondent at the seaport should write a letter of advice to the administrator of the Royal Manufactory at Sevres near Paris, before the forwarding—that the latter may obtain from the director general of the customs, that the box may arrive under seal, *sous plomb*, and that it may not be opened at Paris: this is very important, to the end that there may be no derangement of labels, nor any breakage. It is equally important that the tickets which may indicate the places where the pieces were made, or those from which they come, should not be separated and mixed during the unpacking. It is desired therefore that they may be fastened either with glue, or with good wafers, or with twine.

Lastly, it is very desirable that there should be attached to the case a separate box, either of lead or of tin, or that there should be sent separately, notes, previously made, of the objects collected and for-

*The requests for information and for specimens, apply equally to glass manufactures and their productions.

warded; taking care that a correspondence be established between the objects and the notes, by means of numbers, which shall follow each other, or by numbering the series.

ALEXANDRE BRONGNIART.

The following letter, addressed to Professor Silliman, and taken from the last number of the American Journal of Science and Arts, is worthy of attention.

Statistical information from the various sections of our extensive territory, will not only add to our own knowledge, but be beneficial to the rest of the world.

It would be curious indeed, to observe the effects of the introduction of manufactures of various kinds, and also of the extension of internal improvement.

No other feasible mode of collecting such data can be suggested, and we hope for the sake of the artist, the student, and the manufacturer, that this letter may receive the proper attention.

ON THE ESTABLISHMENT OF STATISTICAL SOCIETIES IN THE UNITED STATES. To PROF. SILLIMAN.—The Statistical Society in Paris have selected me as their representative in the United States, for the purpose of transmitting to them any documents which I might be enabled to procure, and for generally aiding their very useful endeavors in Paris, I respectfully desire to propose for consideration the establishment of a "General Statistical Society" in the United States, and to give general publicity to this I have selected your widely circulated Journal as the organ of communication.

The Statistical Society of France was established by Monsieur Cæsar Moreau in 1829; by the high talent of this gentleman, his extensive and varied information, joined with his activity and industry, this society has now the united assistance of almost every government in Europe. The immediate object of the Society rests upon the fact, that the knowledge of mankind increases in proportion to its tendency to observe, and that Statistical Tables, connected with general and particular information, tend greatly to facilitate this developement.

To gather and condense facts which tend to show the increase or decrease of Population, the prosperity of Arts and Manufactures, the state of public instruction, to develope the true state of Agriculture, and generally to make known the exact internal state of a great nation, its imports and exports, the state of its national funds, and those of Chartered companies, must ever claim the attention of every enlightened community. In aiding the deliberations of Government, I deem it of the highest importance, and I am enabled to state that the European Governments have already experienced great advantages from the labors of Statistical Societies, and from that of France in particular. They have tended to facilitate the views of the Statesman, by offering to him in a condensed form, the internal sources of wealth, not only of his own, but of surrounding nations; their labors render the public happiness more secure, inasmuch as the dark paths of the future may become enlightened by the experience of the past; they offer a solid basis for political and social economy, and they relieve and assist the Ministry, of a Government by condensing and bringing to a focus, not only the minutiæ, but deduced facts relative to the internal or external power of any nation, either remote or in their immediate vicinity.

In the United State of America, however, the existence of such Societies must be of incalculable benefit. The embryo gigantic powers of this Republic are now beginning to develope themselves, and it is of primary importance that the grand stream of prosperity be directed into that course which will not only secure the present prosperity, but also the future greatness of the United States, whilst it must add to the welfare and happiness of her population.

The present popular system of rapid and cheap communication, has already been anticipated by the enterprising genius of the United States, and she forms a very prominent example of the immense advantages which a nation derives from the projection of such plans as shall tend to give full scope to the energies of the people, whilst at the same time it opens the paths to the developement of her internal resources, commercial, mineral or agricultural.

To mark out and prudently to direct the course of such facilities of communication, requires the aid of statistic information. The fecundity of the soil, the amount of population, the manufactured products and their separate values, each require particular consideration; and this can be obtained only by personal research. The condensation of such researches forms one of the leading features of a Statistical Society. To accumulate and condense the information given by modern authors, and more particularly that offered by persons who have occasion to visit foreign countries for scientific research, forms the object of the "Universal Statistical Society of France." To contrast the present degree of prosperity with the past, and to inquire into the causes of the increase or diminution, is its particular care; to trace the gradual development of the causes which have influenced the progress, increase, and present actual state of the wealth and power of civilized nations, forms the grand utility to society produced by their united labors; and finally, to contract into one general focus the energies of each nation, and comparing the state of their society both moral and political, their commerce, internal, and their state of Literature and the Fine Arts, with that of another Empire, demands for it the title of "Universal," and eminently merits the zealous support of every enlightened individual, whose nobility of mind prompts him to offer his mite to the general stock of knowledge.

Should this communication through your Journal be the means of having formed in your principal cities, establishments of a statistical nature, be assured that each Society will receive every aid and assistance from the "Universal Statistical Society of France," which will ever be anxious to advance their researches, and to act with them reciprocally.

I have the honor to remain,
Your very obedient serv't,
CHARLES SANDERSON.
Member of the U. S. S. of France, the Imp. Agri. Soc. of Vienna, &c. &c.
New-York, Dec. 10, 1836.

From the Repertory of Patent Inventions.

SPECIFICATION OF THE PATENT GRANTED TO FRANCIS BREWIN, OF THE OLD KENT ROAD, IN THE COUNTY OF SURREY, TANNER, FOR CERTAIN NEW AND IMPROVED PROCESSES OF TANNING.—SEALED JANUARY 11, 1836.

To all to whom these presents shall come, &c. &c. *Now know ye*, that in compliance with the said proviso, I, the said Francis Brewin, do hereby declare that the nature of my said invention, consists in the making or preparing a new liquor or liquors for tanning or manufacturing raw hides and skins into leather, and for retanning leather manufactured in the ordinary way from certain exotic substances, which have not heretofore been in use for manufacturing leather in this country, or from a combination of these substances with other materials already in common use, by means of which new liquor or liquors, leather can be manufactured of a superior quality in less time than usual, and at much less expense, and by which also leather manufactured in the ordinary way may be improved in quality. And I declare that the manner in which the said invention is to be performed, is fully shown and set forth in the following description thereof, (that is to say):

I employ in the making and preparing of the said new tanning and retanning liquor or liquors, certain substances known in English commerce by the names of gum-kino, divi-divi, and terra-japonica, all of which I find contain much larger proportions of tannen than the best English oak bark, and yield liquors, possessed respectively of the following properties:—a solution of gum-kino imparts to leather a brownish red color, but improves it considerably in point of closeness and firmness of texture; a solution of divi-divi gives a very light color to leather; a solution of terra-japonica, of the sort generally imported in small square pieces, gives a dull light color, and one of terra-japonica of the sort generally imported in large cakes, a brownish red similar to that obtained from gum-kino. A solution of divi-divi I prepare in the same way as the ordinary bark liquors are made in vats or lecks by tanners.—But gum-kino and terra-japonica require to be treated in the manner following. If the gum-kino is in large pieces, or if the terra-japonica is of the sort which is sold in large cakes, I first break these large pieces and cakes with a hammer into small pieces; I then steep the whole for about three days in cold water, or cold weak tan liquor; after which I put the whole into what I call a rubbing tub of the construction shown

in the drawing in the margin hereof, for the purpose of being still further reduced; or I use hot water, or hot weak tan liquor, in which case I put the whole of the materials at once into the rubbing tub, and leave them to steep for about an hour only, which last process is that which I prefer. This tub is about five feet deep and four feet wide in every part, and has a loose cover just so much smaller to it in circumference that when not kept up by the materials in the tub, it will readily fall to the projection or stopper, fixed at about four inches from the bottom, and in this cover, on the under part thereof, about one hundred spikes of copper, wood, or any other material that will not stain the liquor, of about three inches long, are firmly inserted. A square wooden shaft, about five inches thick, with a wheel or handle at top to turn it by, is passed through an orifice of corresponding size and description in the centre of the cover, and drops into a recess in the bottom of the tub, large enough to allow the shaft to turn freely within it. The materials having stood sufficiently long for steeping, the shaft of the tub is worked round by manual or other power, which carries around with it the loose cover with the spikes underneath, till, by the stirring and rubbing action of the spikes, the pieces of the gum-kino or terra-japonica in the tub, are either successively dissolved or reduced to such small dimensions as to pass easily between the cover and the sides of the tub; and in order that the said cover may press continually downwards on the materials in the tub, and descend as the materials become dissolved or reduced to the dimensions aforesaid, a heavy weight or weights is or are placed and kept on the top thereof during the whole of the operation: and in preparing the said solutions for use I employ more or less water or weak tan liquor, according to the sort of leather which is intended to be manufactured; (that is to say,) for sole leather I use about fifty to one hundred pounds of the gum-kino, or of the divi-divi, or of the terra-japonica, with about one hundred gallons of water or weak tan liquor; and for manufacturing dressing leather, I use with every fifty to one hundred pounds of the divi-divi and light terra-japonica about three hundred gallons of water or weak tan liquor, rarely using the gun-kino or dark terra-japonica at all in the manufacture of dressing leather, or any sort of leather in respect to which color is an object; or instead of at once dissolving the said materials in the said proportional qualities of water or tan liquor, I dissolve them at first in any smaller quantities of water or weak tan liquor, and afterwards reduce the solutions to the required strength by the addition of water or weak tanning liquor; and when I have, by the processes aforesaid, obtained the requisite solutions of gum-kino, divi-divi, light terra-japonica, and dark terra-japonica, I generally mix for sole leather the different solutions together in a common tan vat in the following proportions; (that is to say,) one quarter of the solution of gum-kino, one quarter of the solution of divi-divi, one-eighth of the solution of the dark terra-japonica, and three-eighths of the solution of the light colored terra-japonica; I then put into the liquor so prepared and compounded, about one fourth more raw hides or skins than would in general be put by tanners, into an equal quantity of bark liquor, and with every hide I put on an average about one pound of oak bark in the same way as tanners now use bark in the vats with hides and skins. For manufacturing dressing leather, I mix the solutions of divi-divi and light terra-japonica, prepared as before mentioned, and put the hides or skins into them with the same proportions of bark and liquor as are hereinbefore directed to be used in the case of sole leather. When the leather is required to be of a very close and firm texture, and the color is a matter comparatively unimportant, I make use of a larger proportion of the liquor of gum-kino than is before directed, and when the dark terra-japonica is low in price, and when the color to be given to the articles is immaterial, I also make use of a larger quantity of that material than of any of the others; and when it is desired to have the leather of a color lighter than that which results from the combinations of all the four liquors in the proportions before recommended, I diminish the proportional quantities of the dark coloring substances according to the particular shade of color required to be given to the article. And whereas some one or more of the said articles may occasionally be so scarce in the market, or so high in price that it may not be practicable or economical to employ it or them in the quantities before recommended with the other substances, I declare that the use of any one or more of the said substances may be dispensed with either wholly or partially, but subject to the following modifications in the effects produced; (that is to say,) if gum-kino be used alone the leather produced will be too hard and close for general purposes; if divi-divi be used alone, it will produce leather lighter in color than usual; if terra-japonica be used alone, an article will be produced possessed neither of that firmness nor that color which is generally desirable in leather, while, by the addition of divi-divi to gum-kino or terra-japonica, a better article is produced than can be obtained from either gum-kino or terra-japonica separately. And whereas also the prices of all the four articles aforesaid may, at times, rise so high that, notwithstanding their superior tanning properties, they cannot with economy be entirely substituted for oak bark, or any of the other barks or tanning materials now in common use, I declare that the same may be advantageously used in combination with the said common materials in the proportions following; (that is to say,) any given quantity of gum-kino, divi-divi, and terra-japonica, mixed in the proportions before recommended, may be combined with any quantity of oak bark; or any given quantity composed of six-twelfth parts of light terra-japonica, four-twelfth parts of divi-divi, and two-twelfth parts of gum-kino may be combined with an equal quantity of mimosa bark or kermac root; or any given quantity composed of gum-kino, divi-divi, and terra-japonica, in equal proportions, may be combined with two-eighth parts of valonia, and two-eighth parts of oak bark; or, lastly, eight parts of gum-kino, divi-divi, and terra-japonica may be combined with two-eighth parts of oak bark, and one-eighth part of shumach. When gum-kino, or divi-divi, or terra-japonica, or any of them, are intended to be used along with oak or other bark, they may either be ground very small in a common bark mill, after being well dried, if not sufficiently dry for grinding in their original state, and then mixed up with the bark, or the bark and divi-divi may be steeped by themselves in the taps, and the liquor drawn off and made hot, and then put in such quantity into the rubbing tub as is necessary to dissolve the gum-kino or terra-japonica, as before described, which latter method is that which I prefer; or water or weak tan liquor alone, either hot or cold, may be used to dissolve the new materials before mixing them with the common liquors; the liquors made from these various articles I prefer using of about the same tanning strength as those made from the new materials alone; and though the proportions in which I have hereinbefore directed the gum-kino, divi-divi, and terra-japonica to be mixed with each other, or with oak bark and others of the materials already in common use, are those which I have found to answer best under ordinary circumstances, I declare that the said proportions may be varied at the discretion of the practical tanner according as the taste of customers in respect to the color of leather may vary, or according to any particular quality desired to be given to the manufactured article, or according to the comparative cost at different times of the different materials. And I declare that for retanning or improving leather made in the ordinary way, I put it into a fresh liquor, the same as is hereinbefore directed to be used for sole leather, and after it has remained therein for one day, I handle it, I then allow it to remain in the liquor for from eight to fourteen days, after which I take it out and dry it, and, if necessary, restrike it; and I declare that what I claim as my invention is the making and preparing of a tanning liquor or liquors for tanning or for manufacturing raw hides and skins into leather, and for retanning leather manufactured in the ordinary way with gum-kino, divi-divi, and terra-japonica, either employed separately or combined with each other, or with other substances already in common use, in the different proportions, and in the manner hereinbefore specified, or in any other proportions and manner which a change of circumstances may render more suitable; and such my invention being, to the best of my knowledge and belief, never heretofore used in this country, I do hereby declare this to be my specification of the same, and that I do verily believe this my said specification doth comply in all respects fully and without reserve and disguise with the proviso in the said hereinbefore in part recited letters patent contained; whereof I hereby claim to maintain exclusive right and privilege to my said invention.—In witness whereof, &c.

Enrolled July 11, 1836.

From the Encyclopedia of Agriculture.

CHARACTERISTICS OF FLEMISH HUSBANDRY.

To make a farm resemble a garden as nearly as possible, was their principal idea of husbandry. Such an excellent principle, at first setting out, led them, of course to undertake the culture of small estates only, which they kept free from weeds, continually turning the ground and manuring it plentifully and judiciously. Having thus brought the soil to a just degree of cleanliness, health and sweetness, they ventured chiefly upon the culture of the more delicate grasses, as the surest means of acquiring wealth in husbandry, upon a small scale, without the expense of keeping many draught horses or servants. After a few years experience, they soon found that ten acres of the best vegetables for feeding cattle, properly cultivated, would maintain a larger stock of grazing animals, than forty acres of common farm grass: and the vegetables they chiefly cultivated for this purpose were lucerne, sainfoin, trefoils of most denominations, sweet fenu-greek, (*Trigonelle*,) buck and cow wheat, (*Melampyrum pratense*,) field turnips and spurry, (*Spergula*) by them called marian-grass.

The political secret of Flemish husbandry was, the letting farms on improvement. Add to this, they discovered eight or ten new sorts of manures. They were the first among the moderns who ploughed in living crops, for the sake of fertilizing the earth, and confined their sheep at night in large sheds built on purpose, whose floor was covered with sand, or earth &c., which the shepherd carted away every morning to the compost dung hill. Such was the chief mystery of the Flemish husbandry.

Urine cisterns are formed in the fields, to receive purchased liquid manure; but for that made in the farm yard, generally in the yard, or under the stables. In the latter case, the urine is conducted from each stall to a common grating, through which it descends into the vault; from thence it is taken up by a pump. In the best regulated farmeries there is a partition in the cistern, with a valve to admit the contents of the first space into the second, to be preserved there free, from the more recent acquisition, age adding considerably to its efficacy. This species of manure is relied on beyond any other, upon all the light soils throughout Flanders, and even upon the strong lands, (originally so rich as to preclude the necessity of manure) is now coming into great esteem, being considered applicable to most crops and to all the varieties of soils.

Fallows, according to Sir John Sinclair, are in a great measure abolished, even on strong land; by means of which, produce is increased, and the expense of cultivation on the crops raised in the course of a rotation, necessarily diminished; and by the great profit they derive from their flax and rape, or coleseed, they can afford to sell all their crops of grain at a lower rate. Notwithstandding this assertion of Sir John, it will be found that a fallow enters into the rotation on all the clayey soils of Flanders.

Flax is cultivated with the utmost care The field intended for this crop, after two or three ploughings and harrowings, is again ploughed, commencing in the centre and ploughed rouud and round to the circumference, so as to leave it without any furrow. The heavy roller is drawn across the ploughing by three horses; the liquid manure is then spread equally over the entire surface, and when well harowed in, by eight or nine strokes with the harrow, the seed is sown, which is also harrowed in by a light harrow with wooden pins, of less than three inches; and the surface to conclude the operation, is again carefully rolled.

Nothing can exceed the smoothness and cultivated appearance of fields thus accurately prepared.

The manure universally used for the flax crop demands particular notice. It is termed liquid manure, and consists of the urine of cattle in which rape cake has been desolved, and in which the *vidanges* conveyed from the privies of the adjoining towns and villages, have also been blended. This manure is gradually collected in subterraneous vaults of brick work, at the verge of the farm next to the main road. Those receptacles are generally forty feet long by fourteen wide, and seven or eight feet deep; and in some cases are contrived with the crown of the arch so much below the surface of the ground, as to admit the plough to work over it. An aperture is left in the side, through which the manure is received from the cart by means of a shoot or trough, and at one end an open ing is left to bring it up again, by means of a temporary pump which delivers it either into carts or tonneaus.

The liquid is carried to the field in sheets or barrels, according to the distance. Where the cart plies, the manure is carried in a great sheet called a *voile*, closed at the corners by running strings, and secured to the four uprights of the carts; two men standing one on each side of the cart, scatter it with hollow shovels upon the rolled ground; or where the tonneaous are made use of, each is carried by two men with poles, and set down at equal intervals across the field, in the line of the rolling.

There are two sets of vessels, which enable the men who deposite the loaded ones, to bring back the others empty. One man to each vessel, with a scoop or rather a kind of bowl with a long handle, spreads the manure so as to cover a certain space; and thus by preserving the intervals correctly, they can precisely guage the quantity for a given extent of surface. For the flax crop, they are profuse, and of this liquid mixture, in this part of the country, they usually allow at the rate of 2480 gallons, beer measure, to the English acre.

With culinary vegetables the Flemish markets are abundantly supplied. Most of these are grown by the small farmers and are of excellent quality. To every cottage in Flanders a garden of some description is attached; and according to the means, the leisure, and the skill of the possessor, is rendered more or less productive.

The general principles of management with all are, frequent digging, careful weeding, ample manuring, and immediate succession. The rotation depends on circumstances. The cheif vegetables in common use are parsnip, carrot, turnip, scorzonera, savoy, jettechou, cabbage, (Brussels sprouts) onions leeks, pease, beans, and all kinds of salading, with another vegetable called *fene haricot*, a large species of French bean, which has a place in the field or garden of almost every farmer; and being sliced down, pod and seed, is made a chief ingredient in all farm-house cookery.

The treatment of asparagus here, and generally in Flanders, differs considerably from our method: in forming their beds, they are not by any means particular as to very deep trenching, or a profusion of manure; nor, as they grow up, do they cover the beds with litter for the winter, nor fork and dress them in the spring; in the furrows they form a rich and mellow compost of earth and dung, with which before winter sets in, they dress up their beds to the height of nearly eighteen inches from the level of their crowns, and without any further operation, (except supplying the furrows again for the ensuing year,)as soon as the buds appear, they cut them 9 inches under the surface; by which means, having just reached the light, the whole of the stock is blanched and tender.

Every substance that constitutes, or is convertible to manure is sought after with avidity, which accounts for the extreme cleanliness of the Flemish towns and pavements, hourly resorted to with brooms and barrows, as a source of profit. Even the chips which accumulate in the formation of shoes worn by the peasantry, are made to constitute a part of the compost dung heap; and trees are frequently cultivated in barren lands, merely to remain till their deciduous leaves shall in the course of time, have formed an artificial surface for the purpose of cultivation. The manures in general use are—

The farm-yard dung, which is a mixture of every matter that the farm yard produces, formed into a compost, which consists of dung and litter from the stables, chaff, sweepings, straw, sludge, and rubbish, all collected into a hollow part of the yard, *so prepared as to prevent the juices from being wasted*; and the value of this, by the cart load of 1500 lbs. of Ghent, is estimated at five franks.

The dung of sheep, pigeons or poultry, by the cart load, five franks and a half.

Sweepings of the streets and roads, same quantity, three francs.

Ashes of peat and wood mixed, same quantity, eight francs.

Privy manure, and urine, same quantity, seven francs.

Lime, same quantity, twenty-four francs.

Rape cake,, per hundred cakes, fifteen francs.

Gypsum, sea mud, and the sediments of canals, have been all tried experimentally, and with fair results; but the two former have been merely tried; the latter is used successfully in the vicinity of Burges.

Bone manure was altogether unknown in Flanders, but at the suggestion of Radcliff, is now under experiment in that country.

[From the Southern Agriculturist.

ON GRASSES.

COLUMBIA, S. C., Oct. 28th, 1836.

DEAR SIR,—Having been long deeply sensible of the importance of a successful cultivation of the Grasses in our State, I have applied my attention to that subject, with some considerable assiduity and care, for several years past; and am sorry to say, I have not as yet met with that encouragement I had very earnestly hoped for, and had anticipated. Nevertheless, I am not so much discouraged as to deter me from further trials; nor do I, in the least, despair of ultimate and complete success, if the experiments should be persevered in, with an assiduity and a sound discriminating judgment, commensurate, in any moderate degree, with the vast importance of the object. Every planter and farmer is fully sensible of the prodigious disadvantages under which he labors, from the want of rich and abundant pasturage and forage grasses. He cultivates richly emunerating staple productions, and receives very handsome annual incomes of money; but, from the sterile face of the country, as regards the grasses and forage, he finds his income unavoidably and deeply encroached upon and drained, by the annual purchase of mules, horses, pork, and beef. In fact, he finds his seemingly lucrative employment rather a tantalizing fiction than a substantial reality. Indeed, it has been asserted, by some of the profoundest writers on agriculture, and I am inclined to believe with much truth, "That no country was ever known to be really and permanently flourishing, that was destitute of rich and succulent grasses,"

That South Carolina is incapable of producing a rich supply of the grasses, it would be absurd to suppose. I remember the time myself, when almost the whole surface of her soil, especially in the upper country, was a rich natural meadow, of the most succulent and nutritious herbage and grasses: and a soil so fertile as hers's is, in the production of other valuable articles, it would be preposterous to conclude, is sterile in the grasses. The truth is, we forget that every climate and soil has its own peculiar adaptations to certain vegetable productions; and not less so to certain species of grasses than to any thing else. That our climate is too hot and arid for the grasses, is a mere chimerical assumption. We know that the richest pasture lands in the world are found between the Tropics; and the species of grasses which luxuriate there, would at once dwindle and fail in a high northern latitude, as certainly as the northern kind do at the south. Our error, heretofore, has manifestly lain in seeking our grass seeds in climates entirely too cold. We have persisted in endeavoring to force the culture of the northern grasses in our southern climate, instead of seeking them amongst the indigenous and succulent kinds in our own soil, and elsewhere still further south. It would be absurd to attempt to force the culture of clover and blue grass in the Island of Jamacia; but the Guinea-grass, first introduced by accident from Africa, luxuriates there in a most extraordinary manner, and has proved to be a mine of wealth to that people. In like manner, we have no reason to despair, that with a proper spirit of enterprise and perseverance, we may yet succeed in finding some species of the grasses, that may flourish and revel in Carolina, equal to the clover and Timothy of the northern States, or the Guinea-grass of Jamaica.

And although it is to be feared that many species of the native grasses best adapted to our soil, have become extinct by our negligence, yet perhaps it is not the case with all of them. And, by diligent observation, perchance, a solitary vigorous and succulent tussock may be found in some unfrequented nook, or perhaps in more exposed situations, which, upon trial, may prove equal to our most sanguine wishes. Witness, the Gama-grass, which is a native in almost every part of the State, and which gives a more flattering promise than any other that has ever been tried; yet this grass had never commanded the slightest attention until very re-recently. There may be other kinds, still superior to this, which we are treading under foot every day without notice; and which, if brought in cultivation, might cause our land to teem with animal life, and diffuse an aggregate of prosperity, wealth, and human enjoyment, of which, at present, we hardly have a conception. But if there are none such here, let us not despair: let every one exert himself to introduce seeds from elsewhere. The innumerable species of grass and forage plants growing upon our luxuriant prairies of the south and west, are all, as yet, untried. And South America, for aught we know, may be producing grasses, that, if introduced here, might clothe our fields spontaneously with an inexhaustible abundance of the richest pasturage and forage. But to accomplish this desirable object requires the united exertions of every citizen. There must be a widely diffused anxiety for effecting the object, and a pervading spirit of emulation every where, before we ought to look for success in the pursuit. A single individual, it is true, might perchance hit at once upon the very grass best adapted to our climate and soil, but it would be more an accident than any thing else; but if thousands were engaged in similar experiments at the same time, they could hardly long fail of success. In hopes, therefore of giving some stimulus to the laudable undertaking, I have been induced to offer you this brief communication; and although I have not much else than an account of failures to present to you, yet I conceive even these are not without their utility. They may serve to prevent others from repeating the same experiments, and thereby save them from disappointments and loss of time, whilst they may at once direct their attention, and make their attempts, in some other untried direction. Let no one be deterred from the undertaking, from a fear of the expense, or a loss of labor that it may require. One peck of seed is sufficiently ample for the experiment, and the labor bestowed in sowing a peck of seed is comparatively, nothing. Experiments upon the small scale are every way to be recommended; they cost but little, and are quite sufficient for showing the result of the inquiry in hand. A careful observer may perceive, almost at a glance, after his plants egt into growth, whether it is congenially located, or not. If its adaptations are complete, it will, at once, throw out unequivocal evidence of the fact. It will, for the most part, exhibit vigorous habits, and will not droop or fade for slight and trifling causes. On the contrary, a plant uncongenially located, will early exhibit a delicate appearance, and will languish and droop from causes slightly adverse to it: and a peck of seed, with due attention, is quite as sufficient for ascertaining the adaptation of the plant to its soil, as many bushels would be.

I have made two trials to cultivate the red clover. One of them was made in 1816, on rich river-land in Richland district. It was sowed in February, without oats, and, at the same time, was applied, one bushel of gypsum to the acre. It came up well, and flourished until the oats were cut off; but there came a drought in July and August, in which, it nearly all perished. I again tried it in 1832, with orchard grass, on fresh and somewhat clayey and fertil highland, in Fairfield district; and, although I applied manure somewhat liberally, and a bushel of gypsum to the acre, it did not flourish so as to make it an object to cultivate it, either for forage or as a grand manure. Clover, I think, requires carbonate of lime, as well as gypsum, in the soil. In February 1832, I sowed down four acres of orchard grass seed (*Dactylis Glomerati*) on high fresh land. This soil was somewhat clayey, and, naturally fertile, with a good deal of small hornblende and fellspar stones in it. I had left the lofty oak standing upon it, about one hundred or a hundred and fifty feet apart; two bushels of my fine clean seed were put upon an acre with some red clover seed and oats, it came up very finely, and flourished until June, when we had a drought with great heat; the grass began to turn yellow in patches on the poor spots, when gypsum was applied at the rate of one bushel to the acre, this caused an immediate change in the grass, it became green and went on growing finally; in August it made an effort to seed but they became blasted and faded; during seeding time the grass faded and declined, but in September it began to spring again, and grew until January, when it stopped growing, but, continued green underneath all winter. Early in March 1823, it began to grow again, and flouished in an encouraging manner; in the winter, it received a pretty liberal supply of cotton-seed manure, and, in June, it got a bushel of gypsum to the acre; it would have afforded rich pasturage during this spring, but, being anxious to make seed, it was reserved for that purpose, in July and August, it made again another effort to seed, but the heads all blasted, the grass again partially died down; but in September it sprung up and held on the same course as of the year before.

Early in March, 1834, it was ready for pasturing and fifteen mules were pastured on it every night, and every Sunday, until the latter part of July; it bore the pasturing admirably well, and was of the most substantial benefit to the mules, who would recruit on it in a short time. The mules, were again pastured on it in the autumn. Early in March, 1835, it was again ready for the mules; it had received another coat of cotton-seed manure in the winter, and

grew vigorously; it was of equal service to animals this year, as it was during the last; but in August and September, it manifested a disposition to die out and to become thin on the ground. In the spring of 1836, (this year,) it had so died out as to furnish no valuable pasturage, so that I consider it has run its course, and is a failure. For it must be kept in mind, that a grass which requires cultivation with a plough or hoe, or a grass that requires very frequent sowing which will not make seed, and where seed is costly, as this seed is, cannot be cultivated to profit with us. It is worth remarking, that this grass, in very rich spots, grew most luxuriantly, to the length of eight and ten feet; and that it grew every whit as well under the shade of the oaks, up to close around the foot of the trunks, as any where else.

In February, 1834, I sowed, broad-cast, a lot of high land, inclined to be sandy, with the tall meadow oat grass seed, (*Avena Elatior.*) The lot was highly manured, and the grass came up and looked green and vigorous; but when the heat of summer came upon it, it began to die out, and by the month of September, there was scarcely a plant of it to be found.

In February of the same year, (1834,) I sowed a lot of Herd's-grass, or red top, (*Agrostis vulgaris,*) on rich river bottom land, inclining to be stiff, and dry enough for the culture of corn; the grass came up well, and continued green all the year, but never rose six inches above the ground, and in the second year had nearly disappeared.

In February of the same year, (1834,) I sowed a lot down with furze grass, on the same kind of river bottom as the last. It came up well, and continued green all the year, but never grew more than six or eight inches high; and in the second year had nearly disappeared.

In February of the same year, (1834,) I sowed down a lot with the seed of green seward, (*Poa viridi,*) on the same kind of river bottom as the two last. It came up well and flourished. It keeps green all the year, and what is important, it keeps its verdure and continues to grow apparently as well in the winter as in the warm season. It is naturally a short grass, and with me it is not more than two or three inches in length: it grows very thick on the ground, and is a fine soft grass. It promises to occupy the ground in a very durable manner, as it now has as firm a hold of the lot as it had the first year. And although it would not warrant the employment of valuable planting lands in this grass, yet I cannot but think if the waste stiff bottom lands on our rivers were put down in it, it would be found extremely valuable for sheep pastures. It has every appearance of being most peculiarly adapted to that animal, and particularly for winter pasturage. I have several lots of *Leersia Oryzoides* on rich boggy grounds, which some years will yield spontaneously heavy returns of excellent hay. It is an excellent grass, and grows extremely thick and rank on land, with a season exactly adapted to it; but it requires a very moist soil, which, in a wet year, as the present has been, becomes too wet to make the hay; and if it should be a much dryer soil, it will fail entirely in a dry season. This uncertainty, of course, detracts from its value; nevertheless, it is still a valuable grass, and those who have soils adapted to it would do well to cultivate it.

I have reserved an account of the Gama-grass for the last, although in the order of time it was one of my early experiments. I have done so, because it has flattered me with a much better prospect of success than any other grass, and therefore I have more to say on the subject. In the summer of 1832, I collected with difficulty, as much Gama-grass seed as would plant a small lot. It was planted in December, (in drills eighteen inches apart,) of that year, on a sandy lot, pretty highly manured. It came up in the April following, and grew off flourishingly, which it has continued to do ever since. Being desirous of increasing my seed, I have reserved it to the present time for that purpose, and have neither fed it down nor cut it, except some small parcels, which I cut to ascertain how it would be eaten by the horses and mules, both by way of soiling and in the form of hay; which experiments have been fully satisfactory—as I have stood by, and have seen the horses, with sweet corn blades and Gama-grass hay before them, eat of each, without discrimination or preference for either—partaking first of one, and then of the other. They eat it greedily also in the withered state, by way of what is termed soiling. The grass on this plot grows with prodigious luxuriousness, the blades getting the length of ten and twelve feet, and forming a sward on the ground, as it bends down and settles, of the depth of eighteen or twenty-four inches. I have been sedulously engaged in collecting seeds from this lot, and from other sources, for which I have paid twenty-five cents a quart, or ten dollars per bushel, until I have now a lot of three or four acres on rich alluvial bottom lands. The grass here is luxurious and fine, and next year I expect to reap a most abundant harvest from it. It has been apprehended by some, that this grass is too coarse to be eaten by horses and mules; but I am fully persuaded, indeed convinced, that this is a groundless apprehension.—My own limited trials, and authenticated trials from various quarters, all concur to show, that these animals not only eat it, but they eat it with avidity. It is true it may be left to stand without cutting, until it gets too old and tough; but there is no necessity for this. Its growth is so rapid that it may be cut every month, and even at shorter intervals from April until frost, of a length of from twelve to twenty-four inches. When in this young state, it is as succulent, tender and nutricious, as any grass I ever saw.

The only objection I know of to this grass, or rather the only difficulty attending its culture, (for, in fact, I know of no objection to it,) is the difficulty and tardiness of propagating it. It yields seed in abundance, but still they are scarce, and what is likely to keep them so, is the singular manner in which the seeds mature: they form in a spike at the top of a tall seed stalk, and mature only one seed at a time. Its maturity is readily known by its dark chocolate color, but if not gathered at once, it is apt to be lost. The seed seldom adhere to the spike after maturity longer than thirty-six or forty-eight hours, and when it falls, it is concealed in so dense a sward that it is utterly useless to look after it.—Of course the collection of the seeds is a most tedious precess, requiring the daily attendance of hands for several weeks; and although the mature seeds vegetate with sufficient certainty, if planted in November or December, yet from the carelessness of the collectors, and especially when collected for sale, many unripe seeds are sure to be gathered, which renders their vegetation very precarious. This circumstance will, doubtless, retard its extension and rapid propagation, but, I feel confident, it will inevitably work its way, and ultimately be found on every plantation, and then will be esteemed as second only to the richest staple production in the State. Besides its abundant yield and its nutritious qualities, it has some certain habitudes peculiar to itself alone, which recommend its culture. In the first place, such as its special adaptations to our climate and soil, it revels with luxuriance on sandy pine lands, on stiff lands, and light lands, on the rich alluvial soil of the river bottoms, and on the highest and dryest soils; and on the moist lands of the water courses. I have never seen it growing on boggy lands, but I have seen it on the sides of creeks where it was subject to be overflowed by every freshet, and there it grows so rank and vigorous, as to show that it delights in those inundations. Again, it is not only perennial, but it forms larger and stronger roots every year, and grows ranker and stronger, and the period at which it may die out is entirely unknown. But, forming a conjecture from such circumstances as are known, it is, doubtless, a plant of many years duration. Indeed, so strong a possession does it take of the land, that after five years growth it will be impracticable to reclaim the land from it, but by the mattock and grubbing hoe. No plough in this country can do any thing with it. These are rare habits of the plant, and will strike every one as rendering it invaluable; for no grass will be found profitable which requires much pains to cultivate it, and keep it set upon the lands. And moreover, if the seeds could once be had cheaply and abundantly, it could not fail to prove one of the most powerful restorers and fertilizers of our exhausted fields and hill-sides, that has ever been tried. When once well set all washing of the land would be at an end; and if suffered to grow uncut and unfed for four or five years to shade the land in summer, and to spread its own subatance on the land to rot in winter, it could not fail to make the poorest exhausted old field extremely rich. It would require labor to grub up the roots and reclaim the land, but when done the roots alone would give a rich supply of manure.

I have given you these facts from the

record, as I have kept a book, in which I have carefully written the dates, circumstances, and results of every experiment I have made. Although apparently unimportant, the communication of them may nevertheless, perchance, be productive of ome good; and, if I should live, I may, at a future time, trouble you with some further communications.

JAMES DAVIS, M. D.

From the Southern Agriculturist.

STRAWBERRIES.

Charleston Neck.

MR. EDITOR,—In a former number of your useful journal, I read an interesting article on the cultivation of the Strawberry. Too much attention cannot be paid to this delightful fruit; and, concerning the income which an acre or two will yield, if planted in strawberries, I can, along with yourself, bear the most decided testimony.

For the last five or six years, I have been raising this fruit, upon my farm; and never fail to sell it, at from 25 cents to 50 cen s per saucer. If the beds are properly attended, bushels of the berries might be raised, and as readily sold at the above prices.

I shall not enter into an enumeration of the various species of these berries. In a former number of your journal, among the selected articles, will be found, very full information upon the subject. It will be there found, that they are as various in their kinds as any other fruit. Much praise is due to our horticulturists, for their zealous endeavours to introduce the various species of the strawberry into our State. The great success they have met with in this respect, has been more than once evinced by the brilliant and luscious display of this fruit by our Horticultural Society, within the last several years. At its last exhibition, among the other beautiful and delicate varieties exhibited, was one from the garden of Jonathan Lucas, Esq. The fruit measured several inches round, and had every indication of being as exquisite in flavor as it was agreeable in size.

For my own use, I have cultivated the common strawberry of our climate. By care and attention in its cultivation, I am fully persueded, that it may be rendered more productive than any other, and full large enough to gratify the keenest appetite.—However, like all other fruit, the larger the strawberry is made to grow, the coarser does it become to the taste.

I have unconsciously entered into this long preface, Mr. Editor, when my object was, to offer some practical hints to your readers, upon the cultivation of this delicious fruit.

In the article from your pen, to which I have already alluded, you recommend the burning of the strawberry beds, early in March, or during the latter part of February. I prefer doing this at an earlier perior, and you shall have my method.

During the month of December, I lay pine trash, or other combustible matter, over my strawberry beds, and selecting a dry day for the purpose, I set fire to the entire mass.—As the trash burns, it will ignite along with the dry plants, the old decayed leaves of the strawberries, and consume all the old useless suckers.

Immediately after doing this, if your strawberries have grown up the previous year broad-cast, or, as I should otherwise express it, if their suckers have been suffered to take root all over the bed, you should hoe the bed just burnt, in trenches about ten or twelve inches apart, transversely on the bed. After this, well-rotted manure should be scattered in the trenches, and the whole bed should then be covered over with straw or chaff. Tanner's bark will do, if you cannot readily procure the straw or chaff.

The manure, applied as above, will warm the plants, and give them early maturity in the spring.

As soon as the plants shoot forth, the alleys between them should be well stirred, and kept free from all kinds of weeds.

A friend of mine, from the country, tells me, that he has applied cotton seed, with the greatest success, as a manure for strawberries. He applied it in the same way as I recommend the compost to be applied.

I must, however, state here, that no treatment will make strawberries produce well, without transplanting every three or four years. Bearing this in mind, it will be well if we have any plants which are as old as above stated, to transplant during this month. I confess it would have been much better to have done so during the previous month, but having neglected to do so then, it is not too late now.

The plants should be carefully selected, and set out upon a well-manured bed, about ten or twelve inches apart each way. As soon as the plants take, they should be treated as I have already directed.

I remain, Mr. Editor, your obt. servt.

P. J.

The following description reminds us of the beautiful hedges used in some parts of Brazil. The lemon and different species of Mimosa and Cassia are there used, the foliage ever green and the flowers during the whole year relieving the eye, and affording the most delightful fragrance.

Many of our hardy plants could be employed in the same way. The different species of rose, some of them growing to a great length, would be found most suitable, while hundreds of other plants could be joined with them and form a beautiful and useful hedge.

We shall feel delighted to find something of this kind superceding the Smilax (cat brier) so commonly employed, as this last occupies much room and does not furnish an impenetrable hedge without cedars or some firmly rooted wood.

NON-DESCRIPT HEDGES.

Charleston, Nov. 18, 1836.

MR. EDITOR,—DEAR SIR,—By publishing the following letter, from the late Charles E. Rowand, you will, no doubt, confer information, of a valuable nature, upon some of your readers. It treats of the Non-descript Rose, as an article for hedging, which, permit me, to say, I have tried for several years, and can give it my hearty approval.

SANTEE.

Charleston, (S. C.) April 3, 1820.

SIR,—Permit me to suggest, among the varieties enumerated in your essays, as fit for hedging, one which I have been trying for ten or twelve years past, and succeeded equal to expectation, known here by the name of *Non-descript*. It is a large, white, running rose, throwing out a vast profusion of flowers, armed with a great quantity of sharp prickles, which thicken and enlarge in their growth. The proper name, I believe, among Botanists is, Rosa Lævigata.

It is impervious to cattle of every description, and defies the attack of a hog. Eight or ten years' experience empowers me to say so with truth. Being a vine, it thrives best on a moist piece of ground. The mode I adopted to obtain so valuable a fence was, in the first place to make a post and rail one, sufficient to keep off cattle, (having no ditch or bank) then turn up and pulverize the soil about six feet wide, from the fence, to receive the plants, or cuttings; then make three deep trenches with a hoe, in which you plant the cuttings about twelve or fourteen inches long.

The object in planting in trenches, is for the benefit of hoeing and stirring the earth, to promote the growth of the plant, which would otherwise be overrun by the grass, so rapid is the vegetation in the Southern States. The more moist the season, and the thicker the cuttings are planted, the sooner the fence is formed. In three years, a good, substantial one is obtained; and every year afterwards it strengthens with its growth; particularly if the plants have been well attended. It may be clipt with the shears to great advantage, the first season,—and it appears to me, so hardy is the plant, that after having obtained a good growth, the oftener clipt the better, as it tends to make it spread and thicken. Such has been the case with mine. I have on my plantations, many miles, in extent, of the non-descript, both on the post road, leading to Charleston, and fourteen miles distant therefrom, and in the interior of the plantation. Being an evergreen, it is the admiration of travellers passing by. To please the eye, I introduced at about forty or fifty feet distant, the daily red rose cuttings, and the common woodbine and jessamine vines united, which, when in bloom, as they are at present, form a most beautiful contrast, and pleasing sight. I have thus given you a short description of a valuable plant, embracing in itself the *utile* and the *dulce*, to all who will take the trouble to cultivate it as a fence. In my opinion, it is equal to the first of fences; and no doubt it will grow in the northern as well as the southern States.

The proper time of setting out the cuttings is in January and February.

I remain, very respectfully,

Your most obedient,

CHARLES E. ROWAND.

I. S. SKINNER, Esq.

TEA IN JAVA.—We learn from the Bengal Herald, of July 10th, that the tea-plant is now cultivated quite extensively in Java, and with great success. On the 17th of

May, there were more than 20,000 pounds ready for shipment; and in the course of a few years, the crop is expected to increase to a million pounds per annum.

From the Repertory of Patent Inventions.

SPECIFICATION OF THE PATENT GRANTED TO CHARLES WATT, OF CLAPHAM, IN THE COUNTY OF SURREY, GENTLEMAN, FOR CERTAIN IMPROVEMENTS IN PREPARING, PURIFYING, AND REFINING TALLOW, STUFF, FATTY MATERIALS, AND ANIMAL AND VEGETABLE OILS, FOR VARIOUS USEFUL PURPOSES.—SEALED SEPTEMBER 8, 1836.

To all to whom these presents shall come, &c. &c. *Now know ye*, that in compliance with the said proviso, I, the said Charles Watt, do hereby declare that the nature of my said invention, and the manner in which the same is to be performed, are particularly described and ascertained in and by the following description thereof, (that is to say):

My invention of improvements in preparing, purifying, and refining tallow, stuff, fatty materials, and animal and vegetable oils, for various useful purposes, consists in subjecting rough fat, tallow, stuff, or other fatty materials, or animal oils to a process of boiling with water, and certain chemical agents, ingredients, materials, mixtures, or compounds hereinafter stated, for the purpose of separating the same from foreign matters and impurities, and rendering the materials better and more fit for the various purposes for which they are used, and particularly, first, as regards tallow for the purpose of separating or liberating the tallow from the animal substances, containing gellatin, fibrin, albumen, or coloring matter, and if necessary, afterwards washing or purifying or refining the same in order to remove the said chemicals. And further, as regards animal oils, in submitting them to a similar process of boiling with certain chemical ingredients for the purpose of removing impurities and refining or purifying the same; and after this first boiling, washing or boiling them a second time with certain other chemicals, to remove or neutralize the former, and, at the same time, purifying, refining, or washing the oils. And lastly, in refining or purifying vegetable oils by operating upon them with certain chemical agents, materials, mixtures, or compounds, for the purpose of removing impurities, coloring, glutinous matters, or offensive odors therefrom; all of which processes or operations have for their object the preparing, purifying, and refining the various raw materials, and rendering them better and more fit for various purposes, and which I propose to carry into effect in the following manner. And in order that my improvements may be better understood, I shall detail the processes or operations, stating such proportions, quantities of water, acids, and other chemical agents, materials, ingredients, or compounds, as I have found best to answer the desired purpose; but I do not intend to confine myself to the precise quantities hereinafter stated, as the same may be varied to suit different qualities and states of foulness or coarseness of the stuff, rough fat, tallow, or oils, or other raw materials to be operated upon, as is well known to all tallow melters and refiners of oils.—First, as regards the operation or process of rendering or preparing rough fat, stuff, or fatty materials for the melting or refining and purifying of tallow, I proceed in the following manner: the rough fat, without the necessity of being previously prepared or chopped into small pieces, is to be put into a wooden rendering vat, furnished with a wooden steam pipe leading from a steam boiler or generator, and branching out into several other pipes placed in the bottom of the vat, and pierced with small holes in order to distribute the steam throughout the whole mass of materials under operation. To about each ton of rough fat in the rendering vat I add about four gallons of water and then let on the steam and continue it until the mass boils, when I add, as hereafter directed, the following chemical mixture or compound prepared an hour or more before it is wanted. First, I take four pounds of good sulphuric acid (which I prefer to be of the specific gravity of about 1900), which is gradually and continuously to be diluted by pouring it very slowly into two gallons of cold water contained in a wooden vessel, the water being repeatedly stirred with a stick during the mixing; or muriatic acid may be substituted for sulphuric acid, when eight pounds of it will be required instead of four of the former, and only half the quantity of water; in this case there is no necessity for any particular caution in the mixing as with sulphuric acid, as there is no disengagement of heat. To either of the above mixtures of diluted acids, when cold, I add one pound of good nitric acid, which I prefer of about the specific gravity 1045, and then half a pound of the bichromate of potassa, in order to supply an additional quantity of oxygen and to prevent any discoloration by the use of the nitric acid; and to these I add half a pound of oxalic acid; the whole is then to be well stirred, and, when sufficiently mixed, one quart or three pints of this compound (to each ton of rough fat or stuff) is to be put into the boiling materials in the rendering vat, at intervals of about every twenty or thirty minutes, and the boiling continued until the dabs or lumps are nearly dissolved; when this is the case, I add to the materials under operation the following compound (prepared only at the time it is about to be used); I first (in the proportion of to every ton of fat or stuff) dilute or mix one pound of strong nitric acid with one quart of water, into which mixture I put two ounces of rectified spirit of wine, naptha, sulphuric ether, or spirit of turpentine; after this compound has been added to the fat under operation, the boiling is to be continued for about half an hour, and after all the dabs or pieces of fat are rendered or melted the steam is to be stopped off and the tallow left quiet about ten minutes for the purpose of allowing the refuse to settle, when the water and chemicals underneath the tallow are to be drawn off, and about two gallons of fresh water to each ton of rough fat or stuff is to be then put in the rendering vat, and the steam let on again and continued till the tallow has boiled about ten minutes. After this washing process, the boiling is to be stopped, and the materials left to settle, in order that the tallow may become cool and fit to be packed off. In rendering fish oils in wooden vessels that is boiling or melting, and partly refining and purifying, such as whale blubber, fish livers, and other parts containing fish oils, the following modification of the process is necessary. The rendering mixture in this case should contain the following proportion of sulphuric and muriatic acids: viz., four pounds of the former diluted with two gallons of water, as described in the former part of this specification (respecting tallow), and six of the latter acid also diluted with two gallons of water, these diluted acids are to be mixed together after the diluted sulphuric acid has become cold; and to this compound is then to be added and well stirred therewith, half a pound of bichromate of potassa and a like quantity of oxalic acid. This compound is to be added to the boiling rough materials containing animal oils at intervals of twenty or thirty minutes, in the proportion of two quarts, at each time of adding, to every ton of materials under operation, until all the fatty or oily substance (such as whale blubber, livers of fish, and other parts containing oil) are reduced or rendered. This will be shown on examining the mass under operation and indicated by any parts containing oil floating beneath the surface of the fluid oil, and above the surface of the water, and thereby the operator will know if the process is to be stopped or continued; after this oporation is performed, the under liquids and chemicals may be drawn off, about two pounds weight of powdered chalk or marble to each ton of raw material is to be thrown into the vat and well stirred therewith, when the whole is to be boiled for ten or twenty minutes in order that the chalk or marble may combine with and remove any acid adhering to the oil. The now rendered or purified oil is then allowed to settle, when it may be removed for use. In the further refining and purifying of tallow, if necessary or thought desirable, at the time the fresh water is put into the vat after the pumping or drawing off the under water and chemicals, the rendering being completed, there may be added to every ton of tallow a half pound of green oxide of chrome or bichromate of potassa, and boiled with the materials under operation for about ten or fifteen minutes, by turning on the steam the color, odor, and other properties of the tallow, will be much improved by the process. In refining and purifying animal and vegetable oils generally, when in their fluid state, as articles of commerce, I use the following process and compound:—to every ton of oil is to be added a quantity, say one quart of the before mentioned mixture of muriatic acid and oxide of chrome or bichromate of potassa, the oil being stirred well at each time this compound is added, the operation or commixture to be continued until all the

offensive odor, coloring matter, or impurities are removed; I then introduce about three gallons of water to every ton of oil, and from two to three pounds of powdered chalk or marble, to remove any acids adhering to the oils; the oil is then to be left quiet until all the chemicals and water have settled and it has become transparent, when it may be run off into barrels for use. In the case of palm oil, it being ordinarily in a solid state, it must be raised by artificial heat to the temperature of about 120 Fahrenheit's thermometer, and the refining mixture will require to contain in the proportion of about one pound and a half of green oxide of chrome or bichromate of potassa, and four pounds of muriatic acid to each ton of rough materials, instead of the former proportions, and, when the coloring matters are moved, the same quantity of chalk or marble is to be added as in the former case, and three or four gallons of water, and the whole raised to the temperature of about 150°, when the materials will become sufficiently fluid to allow all the chemicals to subside, and after they have been sufficiently stirred together, the whole may be left at rest a sufficient time to allow the oil to become clear and the chemicals to subside, when the oil may be used in various manufactures. Having now described my improvements, and the manner of carrying the same into effect, and in such proportions and quantities as I have found to answer the purpose, I wish it to be understood that what I claim as my improvement in the preparing, purifying, and refining tallow, stuff, fatty materials, and animal and vegetable oils, for various useful purposes, is the boiling and operating upon them by the following compounds, chemical agents, ingredients, or mixtures. First, I claim the combination of sulphuric and nitric acids, and muriatic and nitric acids, for the purpose of rendering in wooden vessels, and likewise oxalic acid, both singly and compounded, as described, and likewise the bichromate of potassa, as it much improves the tallow and prevents the occasional temporary discoloration occasioned by nitric acid; I likewise claim the combination of nitric acid with spirits of wine, naptha, ether, or turpentine, as evolving nitrous gas and nitrous oxide for the purpose of rendering, and by their agency purifying and solidifying the tallow; I also claim the admixture of sulphuric and muriatic acids, and oxalic acids, in rendering fish oils, as whale, seal, cod, &c. &c. I also claim the combination of muriatic acid with oxide of chrome, by which combination there results a double effect, viz.: the bleaching or purifying and refining effect of the bichromate of potassa, or oxide of chrome, with the immense evolution of chlorine gas resulting from the decomposition of the muriatic acid or bichromate of potassa, for refining and bleaching vegetable and animal oils, generally and particularly, as applied to palm oil, which I prefer operating upon at about the temperature of 120°, being that at which the effect is rendered most certain of success and steady operation. In witness whereof, &c.

Enrolled September 8, 1836.

GLASS BEADS.—Few persons, probably, are aware of the amount of trade carried on in this apparently insignificant article. We are told, that from Venice, which contains the principal manufactory, whole ship loads are annually sent to different quarters. The principal customers for them are the various savage tribes in our own continent, in New-Holland, the Pacific Islands, &c. This branch of the glass manufacture still remains to the Venitians, nearly the sole relic of their once boasted superiority in every departmant of the art. No other nation can rival her either in regard to variety and beauty of color, or cheapness of production.

The glass-houses are erected on the island of Murane, about half a league from the city. The alkalis employed are soda and potash the the sand is found in abundance on the neighboring coast. The coloring matters are obtained from the mineral kingdom, and so varied, that the beads present more than two hundred different shades. While the metal is in fusion, the workman dips into it an iron tube, five feet long, and withdraws a certain portion of the adhesive mass. A hole, corresponding to that of the tube, is then made through it. Two workmen have such a tube thus prepared, join them together by the ends, and then separate as rapidly as possible, stretching the PASTE between them. A tube is thus formed, varying in length and fineness, according to the distance which can be attained before the glass cools. In some instances the tube reaches one hundred feet in length, and becomes like the finest hair. They are divided in pieces of two feet in length and then submitted to the bead maker, who with a sort of hatchet, cuts them into fragments of a length equal to their diameter. These fall into a box of powdered charcoal and clay, which gets into the beads, and prevents their filling up when subjected a second time to the action of the fire. Thus cut and mixed with a certain quantity of this dust, they are put into an iron cylinder, sealed hermetrically, and by means of a handle are turned over the fire until the vessel acquires red heat. The beads are then sufficiently softened to lose their asperities and become smooth by friction, and when taken out, it remains only to wash and sort them which last operation is effected by a series of seives of different degrees of fineness. They are then given to women, who thread them in rows of six or seven inches long, and such is the rapidity with which this is practised, that the work can be procured at the rate of a little more than one cent for 120 rows. This quantity sells at from four to ten cents.

From the Railroad Journal.

SYRACUSE, DEC. 12, 1836.

To D. K. MINOR, AND GEO. C. SCHAEFFER.

GENTLEMEN:—I am now able to give you a good account of the Grist, or Flouring Mill, put up at Cato four Corners in Cayuga county. It is now in successful operation and works beyond our expectations.

You will recollect that we have put up an engine there with arms of *twelve feet* in diameter with the shaft placed perpendicular, receiving the steam at the lower end, which, when worked at 120 lbs. to the square inch, will nearly raise the shaft, and arms from their bearing below, and therefore work with very little friction. This engine makes about one thousand revolutions per minute, and the works are driven by cog wheels, instead of bands, as in the smaller engines, and we can give the stones any velocity we desire.

This engine was designed to drive *three run* of stones, and to use steam at 120 lbs. to the square inch, and to grind one hundred bushels of wheat to the cord of wood; and these anticipations have been more than realized, as we have the three run in operation, and grind eight uhels per hour, to each run, with *less* than 60 lbs. of steam to the spuare inch; and usually not to excede three-fourths of a cord of wood to the hundred bushels. Another run might be driven with great ease.

The apertures in the arm of this engine are *each* $\frac{3}{16}$ of a *square* inch, but it is intended to reduce them *one half* at least, and use steam at 120 to 150 lbs. to the inch, when I have no doubt of being able to grind over 150 bushels of wheat with a cord of *maple* wood.

Since this mill was put into operation, two other companies have been formed to erect two other mills on the same plan, for flouring.

This experiment sustains my theory that the *long* arm is best, and I intend to make an engine with twenty feet arms, which, I have no doubt will work *one hundred horse power.*

I have many interesting facts, and shall have others in a few days, in relation to the rotary engine in this mill, which I will communicate to you, and in time, I hope for the next number of the Mechanics Magazine. In the mean time, I am

truly yours.

WM. AVERY.

A correspondent informs us that at the most numerous meeting of the Staffordshire iron-masters ever held, it was unanimously agreed to blow out nearly one-third of the blast furnaces, thereby reducing the make of iron in that proportion.—[Herald.]

LAUREL HILL CEMETERY.

We have lately visited, with no common feeling of admiration the new and beautiful rural burying ground which a few liberal minded citizens have provided at Laurel Hill, on the river Schuylkill, just below the Falls, and about three and a half miles from the heart of the city. In situation and capabilities it is every thing that could be desired,

realizing the wish of the poet to the very letter :—

"Mine be the breezy hill that skirts the dawn,
Where a green grassy turf is all I crave,
With here and there a violet bestrown,
Fast by a brook of fountain's murmuring wave,
And many an evening sun shine sweetly on my grave."

Here the last resting place of friends and relatives may be visited without any of those disagreeable associations connected with our city grave yards. Here the visiter will not be shocked with the mouldering coffin or sunken yawning grave; here the dead will repose amid the beauties of nature, and their memories be associated with the most soothing and most simple emblems of mortality—emblems that are at once the most eloquent advocates of religion, and morality, and the most determined foes to unnatural fear and superstition. Here will be found the tokens of a true and heightened feeling of respect towards that which is again to spring into life—which at once attests man's superiority to the rest of creation, and inculcates the salutary conviction that the spirit lives eternally.

Following out an enlarged view of what will be permanently useful, the proprietors have erected a handsome entrance, of graceful Roman Doric architecture, enclosing Porters' Lodges, &c.; a handsome Gothic Chapel, and a Superintendant's Cottage: a large receiving tomb is ready for those who may have occasion to employ it while they are erecting their own. The very large dwelling house is to be converted into one spacious room large enough for any procession to take shelter in; this and the Chapel will be warmed in winter. In addition, there are spacious coach houses, so that as far as we could judge nothing has been neglected, and the public, while they will be amply accommodated, will have cause to remember those by whom this much needed improvement has been effected.

The Cemetery is one hundred feet above the Schulykill, which washes it on the West, and is bounded on the East by the ridge road turnpike; the latter affords ready access in all seasons. East of the ridge road the company have a small farm which has been converted into a flower garden and nursery; its superintendant, Mr. John Sherwood, formerly gardner to Mr. Platt, will supply shrubbery for lot holders, and at their request keep their lots in perpetual bloom with roses, &c.

The company will no doubt receive a charter from the present Legislature, and give deeds in fee simple ferever to purchasers, subject to wholesome rules satisfactory to all; the price, considering the heavy outlay, is esteemed very reasonable. A very large number of citizens have purchased, and every day adds to their number.

New-York and Baltimore, by municipal regulations have enacted that no burials shall take place within the city; it behoves all of us to anticipate such a law here, and by the removal of our deceased friends to this spot, or by preparation for our families, make arrangements for their quiet repose hereafter TOGETHER. We observed that families, brothers, sisters and cousins, &c., are selecting their lots in the vicinity of each other, that those who were united in their lives may not be separated. Husbands are removing their deceased partners, wives their husbands, children their parents, and parents their children, from the closely crowded grave yards of the city, and with pious care depositing them where they can join them when their earthly pilgrimage is over. Already is the ground studded over with a hillock or a grave stone here and there, and we learn from the Superintendant that very many removals are immediately contemplated.

Alexander Wilson, the distinguished ornithologist expressed a natural wish that he might be buried "where the birds would sing over him;" will not our citizens all unite in heart and purse to carry his wish into execution? We understand such a proposition is entertained, and that a prospectus has been issued to transfer the bodies of Wilson, Godfrey, the undoubted inventor of the Quadrant, Rittenhouse, and Say, to Laurel Hill, and erect over them a mausoleum with suitable inscriptions. Every one we should suppose would contribute to this laudable object.—[Philadelphia Com. Herald.]

MEMORANDUM OF AN EXCURSION TO THE TEA HILLS, WHICH PRODUCE THE DESCRIPTION OF TEA KNOWN IN COMMERCE UNDER THE DESIGNATION OF ANKOY (NGANKE) TEA; BY G. J. GORDON, ESQ.

"Having been disappointed in my expectations of being enabled to visit the Bohea hills, I was particularly anxious to have an opportunity of personally inspecting the tea plantations in the black tea district, of the next greatest celebrity, in order to satisfy myself regarding several points relative to the cultivation, on which the information afforded by different individuals was imperfect or discordant.

"Mr. Gutzlaff accordingly took considerable pains to ascertain for me, from the persons who visited the ship, the most eligible place for landing with the view of visiting the Ankoy hills; and Hwuytow bay was at length fixed upon as the most safe and convenient, both from its being out of the way of observation of any high Chinese functionaries who might be desirous of thwarting our project, and from its being equally near the tea hills as any other part of the coast at which we could land."

"The wind being unfavorable, we made rather slow progress by rowing, but taking for our guidance the masts of some of the junks which we observed lying behind a point of land, we pulled to get under it, in order to avoid the strength of the ebb tide, which was now setting against us. In attempting to round the point, however, we grounded, and soon found that it was impossible to get into the river on that side, on account of sand banks which were merely covered at high water, and that it was necessary to make a considerable circuit seaward to be able to enter. This we accomplished, but not till 1 A. M. At this time a light breeze fortunately springing up, we got on very well for some time, but were again obliged to anchor at ¼ past 2, from want of water. As the tide rose, we gradually advanced towards the town of Hwuytow, till we came to one of those bridges of which there are several along the coast, that extend over wide sand flats that are formed at the mouths of the rivers. These bridges are constructed of stone piers with slabs of stone laid from pier to pier, some extending over a space of 25 feet and upwards, and others being from 15 to 20 feet span. As the length of the bridges cannot be less than three quarters of a mile, the whole is very striking as a work of great labor, if not exhibiting either much skill or beauty. We were informed by some boat people that we should not find water to carry us beyond the bridge, but observing some tall masts on the other side, we resolved on making the experiment, and pushing on as far as we could. It was almost dark when we passed under the bridge, and we had not proceeded far when we were again aground. This, however, we attributed to our unacquaintance with the channel, and as the tide floated us off, we continued advancing, notwithstanding, the warning of a friendly voice from the bridge, that entreated us to return to the town, promising us comfortable quarters, and a guide, &c. Being rather distrustful of the motives of this advice, however, we proceeded for some time longer but at length found it impossible to proceed farther, the ebb having at the same time commenced. We therefore spread an awning, and prepared to make ourselves as comfortable as possible for the night. The day had been the warmest we had experienced for a month past, but the night was very cold, and our boat, as may be imagined, far from commodious for so many people. At daylight, we found that there was not six inches of water in any part of the channel, and from the boat we stepped at once upon dry sand. The survey from the bank showed plainly that it was impossible to proceed any further by water. We accordingly prepared to march on foot, taking with us three lascars, who might relieve each other in carrying our cloak-bag of blankets and great coats, as well as some cold meat. We ordered the people to prepare a meal as fast as possible, intending to make a long stretch at first starting, and Mr. Nicholson was directed to remain in charge of the boat with five lascars, to move her down under the bridge on the return of the flood, and there to await our return for four or five days. Crowds of people now began to gather around the boat, moved by mere curiosity. Mr. Gutzlaff induced some of them to get ducks and fowls, for the use of the boat's crew, and strange to say, prevailed on one man to become our guide, and on two others to undertake to carry our baggage, as soon as we should be a little farther off from the town, and out of the way of observation."

"Skirting the town of Hwuytow, we proceeded in a N. N. E. direction, at a moderate pace, for an hour and a half, when we stopped at a temple, and refreshed ourselves with tea. Nothing could be more kind or more civil than the manners of the people towards us hitherto, and if we could have procured conveyances here so as to have escaped walking, in the heat of the day, loaded as we were with heavy woollen clothes, we should have had nothing further to desire: as it was, my feet already began to feel uncomfortable from swelling, and after another hours march, I was obliged to propose a halt, till the cool of the evening. Fortunately we found, however, that chairs were procurable at the place, and we accordingly engaged them at half a dollar each. They were formed in the slightest manner, and carried on bamboo poles, having a cross bar at the extremities, which rested on the back of the

bearer's neck, apparently a most insecure as well as inconvenient position; but as the poles were at the same time grasped by the hands, the danger of a false step was lessened. We had not advanced above a mile and a half before the bearers declared they must eat, and to enable them to do so, they must get more money. With this impudent demand we thought it best to comply, giving them an additional real each. After an hour's further progress, we were set down at a town near the foot of the pass which we had to cross. There the bearers clamorously insisted on an additional payment before they would carry us any further. This we resisted, and by Mr. Gutzlaff's eloquence gained the whole of the villagers, who crowded around us, to join in exclaiming against the attempted extortion. Seeing this, the rogues, submitted, and again took us up.—Mr. G., mentioned that while we were passing through another village, the people of which begged the bearers to set us down, that they might have a look at us, they demanded 100 cash as the condition of compliance. The country through which we passed swarmed with inhabitants, and exhibited the highest degree of cultivation, though it was only in a few spots that we saw any soil which would be deemed in Bengal tolerably good; rice, the sweet potato, and sugar cane, were the principal articles of culture. We had now to ascend a barren and rugged mountain, which seemed destined by nature to set the hand of man at defiance; yet even here, there was not a spot where a vegetable would take root, that was not occupied by at least a dwarf pine planted for the purpose of yielding fire wood, and a kind of turpentine; and wherever a nook presented an opportunity of gaining a few square yards of level ground by terracing, no labor seems to have been spared to redeem such spots for the purpose of cultivation. In ascending the pass, we soon came to places where it was difficult for our bearers to find a footing, and where they had consequently to pick out their steps as they advanced. To assist themselves, they gave the chair a swinging motion, with which they kept time in raising their feet. This was far from agreeable, and the first impression was that it was done merely to annoy, but we very soon saw that the object was different. The highest point of the pass I should conjecture to be about 1200 feet above the plain, and the descent on the north side to be nearly equal to the ascent from the south, say 1000 feet. At half past four we arrived at a rather romantic valley, which was to be our halting place for the day."

"Nov. 12th. Got into our chairs at a quarter past six, A. M., and proceeded along a narrow rugged dell towards Koeboe. Several nice looking hamlets were seen on the way. The people were engaged in reaping the rice, which seemed heavy, and well filled in the ear. In several places, I observed that they had taken the pains to tie clumps of rice together for mutual support. Sugar cane is bound in the same way, and for additional security, the outside canes are mutually supported by diagonal leaves, which serve at the same time to form them into a kind of fence. The leaves are not tied up round the stalks as in Bengal; the cane is slender, white, hard, and by no means juicy or rich; yet, abating the black fungous powder, which is very prevalent, the surface is healthy, and close growing in a remarkable degree.—We arrived at Koeboe at eight o'clock, and finding we could get water conveyance for part of the way on which we were proceeding, we engaged a boat for that purpose.—After a hearty breakfast, we embarked at 10 A. M. amidst crowds of people who covered the banks of the river at the ghat. On inquiry, we found that the river on which we were proceeding in a W. N. W. course, was the same which passed Nganke heen, and flowed to Tseuenchow foo. The boat was large, but light, and being flat bottomed, drew very little water. The stream was so shallow, that it was only by tracing the deepest part of the channel from side to side of its bed, that we were able to advance at all. This was done by poling; in several places the stream was deepened by throwing up little banks of sand so as to confine its course within a channel merely wide enough for the boats to pass through. I estimated the width from bank to bank at 200 yards, and should judge from the height at which sugar is cultivated above the level of the present surface, that the greatest depth in the rainy season does not exceed 10 feet. Being entirely fed by mountain torrents, its rise must be often very sudden, but I did not observe any traces of devastation in its course. Its name, Nganke, or 'peaceful stream,' is probably derived from this circumstance: the valley on each side seemed well cultivated, the banks being principally occupied by sugar cane. At every village the people poured out as usual to see us, vying with each other in marks of civility and kindness. The day, however, becoming very hot, we took shelter from the sun under the roof of the boat, to the disappointment of many who waded into the water to gratify themselves with a sight of the strangers. Coming at last to a high bank close to a populous town, they actually offered the boatman 400 cash if he would bring us to; and on his refusal, the boys began pelting the boat with clods and stones. On this, Mr. Gutzlaff went on deck to remonstrate, and Mr. Ryder to intimidate with his gun. Betwixt both the effect was instantaneous, and the seniors of the crowd apologized for the rude manner in which the boys had attempted to enforce the gratification of their curiosity. We had been in vain looking out all yesterday and today for a glimpse of tea plantations on some of the rugged and black looking hills close in view, though at almost every place where we halted, we were assured that such were to be found hard by."

"Arrived at Toa-be, we were hospitably received by the family of our guide, and soon surrounded by wondering visitors.

"Mr. Gutzlaff speedily selected one or two of the most intelligent of them, and obtained from them ready answers to a variety of questions regarding the cultivation of the tea plant. They informed him that the seed now used for propagating the plant was all produced on the spot, though the original stock of this part of the country was brought from *Woo-e-shan*; that it ripened in the 10th or 11th month, and was immediately put into the ground where it was intended to grow, several being put together into one hole, as the greater part was always abortive; that the sprouts appeared in the 3d month after the seeds were put into the ground; that the hole into which the seeds are thrown is from three to four inches deep, and as the plants grow, the earth is gathered up a little arouud the root; that leaves are taken from the plants when they are three years old, and that there are from most plants four pluckings in the year. No manure is used, nor is goodness of soil considered of consequence; neither are the plants *irrigated*.—Each shrub may yield about a *tael* of *dry* tea annually (about the 12th of a pound.) A *mow* of ground may contain 300 or 400 plants. The land tax is 300 cash, (720 to a dollar,) per mow. The cultivation and gathering of the leaves being performed by families without the assistance of hired laborers, no rate of wages can be specified; but as the curing of the leaf is an art that requires some skill, persons are employed for that particular purpose, who are paid at the rate of one dollar per pecul of fresh leaves, equal to five dollars per pecul of dry tea.—The fire-place used is only temporary, and all the utensils, as well as fuel, are furnished by the curer of the tea. They stated that the leaves are heated and rolled seven or eight times. The green leaf yields one fifth of its weight of dry tea. The best tea fetches on the spot $23 per pecul, (133⅓ lbs.) and the principal part of the produce is consumed within the province, or exported in baskets to Formosa. That the prevailing winds are northwesterly. The easterly winds are the only winds injurious to the plants. Hoar frost is common during the winter months, and snow falls occasionally, but does not lie long, nor to a greater depth than three or four inches. The plant is never injured by excessive cold, and thrives from 10 to 20 years. It is sometimes destroyed by a worm that eats up the pith, and converts both stem and branches into tubes, and by a gray lichen which principally attacks very old plants. The period of growth is limited to six or seven years, when the plant has attained its greatest size. The spots where the tea is planted are scattered over great part of the country, but there are no hills appropriated entirely to its culture. No ground, in fact, is formed into a tea plantation, that is fit for any other species of cultivation, except perhaps that of the dwarf pine already alluded to, or the *Camellia oleifera*. Mr. Gutzlaff understood them to say that the plant blossoms twice a year, in the eighth moon or September, and again in winter, but that the latter flowering is abortive. In this I apprehend there was some misunderstanding as full sized seeds, though not ripe, were proffered to me in considerable quantities early in September, and none were found on the plants which we saw. I suspect that the people meant to say that the seeds take eight months to ripen, which accords with other accounts. We wished much to have spent the following day the (13th) in prosecuting our inquiries and observations at Toa-be and its neighborhood, but this was rendered impracticable by the state of our finances. We had plenty of gold, but no one could be found who would purchase it with silver at any price. We therefore resolved on making the most of our time by an early excursion in the morning, previous to setting out on our return.

August 5.72; in September 5.66; in October 1.37; in November 3.18; and in December 2.87: from which it will be seen that more rain falls in April, June, July and August, than in other months; and that October and February are the driest months in the year.

During the same three years, from 1st August 1983 to 1st August 1836, the average retrocession of the Mississippi River from high water mark was 7.90 feet in January, 5.13 in Febuary, 4.27 in March, 2.94 in April, 4.63 in May, 4.72 in June, 5.82 in July, 7.97 in August, 13.10 in September, 13.33 in October, 12.34 in November and 8.84 in December—the river being highest in April and lowest in October. Dr. Barton has found that the Mississippi deposites 1 line of earthy particles in every 10 inches of water: that is one foot alluvion in 120 feet water. It might be useful as well as curious to ascertain when the river makes the most deposites; and what impetus or power is necessary to remove deposites or obstructions occasionally or continuously applied. The solution of this might be of great advantage in improving the navigation of the river at its mouth.

But as a mere abstract view of a subject does not always give a positive idea, let us ascertain the climate of New-Orleans as compared with that of some principal cities; by showing the latitude; the distribution of heat in the different seasons, according to the mean temperature; and the maximum temperature of the warmest month with the minimum of the coldest. The statements of other cities are taken from Ure's Dictionary of Chemistry, those of this city from Dr. Barton's table.

	Latitude	Mean temp. of year	Do of winter	Do of spring	Do of summer	Do of fall	Do of warmest month	Do of coldest
Edingurg	55.57	47.8	38 6	46.4	53.2	48.4	59.4	38.3
Dublin	53 21	49.2	39.2	47.3	59.6	50	61	35.4
Geneva	46.12	49.3	34.9	47.6	65	50	66.6	31.2
Vienna	48.12	50.6	32.8	51.2	69.2	50.6	70.6	26.6
Paris	48.50	51	38.6	49.2	64.6	51.4	65.3	36
London	51.30	50.4	39.6	48.6	53.2	50.2	64.4	37.8
Philad'a.	39.56	53.4	32.2	51.4	74	56.6	77	32.7
New-York	40.40	53 8	29.8	51 2	79.2	54.6	80.6	25.4
Cincinnati	39 06	53.8	32.9	54.4	72 8	54.4	74 3	30 2
Marseilles	43.17	59	45.5	67.6	72 5	60	74.6	44.4
Rome	41.53	60 4	45.8	57.8	75.2	62.8	77	42.2
Natchez	31 23	64.8	48.6	65.4	79.2	65.8	79.7	47
Cairo	30.02	72.4	58.4	73.6	85.1	70 5	85.8	55.8
N. Orleans	30	67.2	53.31	67.1	80	68 4	80	54.4
Vera Cruz	19.11	77.8	72	77.9	81.5	78.6	81.5	71
Havana	23 10	78.2	71.2	79	83 3	79	84	70

It may be remarked that these observations on the climate of New-Orleans, include part of 1833, when there was an epidemic, and the extremes of temperature were unusually great; and that the winters '33–'34 and '34–'35 were remarkably cold in this city. And it will be perceived that though the average range of temperature in New-Orleans throughout three years of that kind, was not 30 degrees, the range in Philadelphia, New-York, Cincinnati, Natchez and even Rome was much greater: also that the extremes of heat and cold in New-Orleans are proportioned to those in Paris and Marseilles; and consequently the health of this city, so far as it depends on climates s or can be as good as the health of Marseilles or Paris. *Quod erat Demonstrandum.*

has obtained a general average for the past three years, ending the 1st of August last, of the state of the thermometer, barometer, hygrometer, weather, winds and rivers, as diligently and carefully prepared by Dr. Barton, from personal observations made with the best instruments at all periods. The following are extracts from the table elaborated.

THERMOMTTER.

	Highest	lowest	monthly mean	range
January	72	28.66	53.54	43.33
February	72.66	49.66	51.42	46
March	75.66	46	59.02	29.66
April	80	54	66.75	26.66
May	86	60	75.58	26
June	89	72	79.74	17
July	88.66	73	80.06	15.67
August	89	73	80.16	16
September	83.66	64.66	77.22	19
October	82	47.16	68.55	35.50
November	77.33	34	59.64	43.33
December	71	35.33	54.97	35.67
			67.22	29.48

BAROMETER.

	Highest	lowest	range
January	30.23	29.70	.53
February	30.20	29.75	.44
March	30.23	29.82	.47
April	30.17	29.76	.41
May	30.17	29.85	.37
June	30.14	29.88	.27
July	30.14	29.95	.19
August	30.02	29.78	.24
September	30.07	29.74	.22
October	30.19	29.83	.37
November	30.31	29.69	.58
December	30.20	29.79	.41
			.40

HYGROMETER OF SAUSSURE.

	Highest	lowest	mean	range
January	43.50	0	19.50	43
February	40	0	31	28
March	40.50	0	18.87	40
April	16.33	17.66	42.25	43
May	61.66	14	45.78	47
June	66.66	23.33	48.65	40
July	52	0	36.54	52
August	56	5	40	51
September	65	26	46	39
October	61.50	1	40	66
November	52.50	0	29	52
December	48	0	21	48

ASPECT OF THE WEATHER.

	clear	cloudy	rainy
January	43.66	34.33	13.33
February	51.33	14.44	8.33
March	45.33	36.66	10.66
April	54	23	12.33
May	69	18	8
June	59.33	17.33	11.66
July	51.33	22	15
August	51.39	18.70	11.76
September	56.73	11.83	10.83
October	66.43	12.70	3
November	57.73	43.86	7
December	50.73	23.30	6.30

The average quantity of rain in January of the three years, was 4.66; in February 2.25; in March 2.59; in April 6.21; in May 2.95; in June 6.16; in July 6.38; in

"We accordingly got up at day break, and proceeded to visit the spot where the plants were cultivated. We were much struck with the variety of the appearance of the plants: some of the shrubs scarcely rose to the height of a cubit above the ground, and those were so very bushy that the hand could not be thrust between the branches. They were also very thickly covered with leaves, but these were very small, scarcely above ¾ of an inch long. In the same bed were other plants, with stems four feet high, far less branchy, and with leaves 1½ to 2 inches in length. The produce of great and small was said to be equal. The distance from centre to centre of the plants was about 4½ feet, and the plants seemed to average about two feet in diameter. Though the ground was not terraced, it was formed into beds that were partly levelled. These were perfectly well dressed, as in garden cultivation, and each little plantation was surrounded by a low stone fence, and a trench. There was no shade, but the places selected for the cultivation were generally in the hollows of hills, where there was a good deal of shelter on two sides, and the slope comparatively easy. I should reckon the sight of the highest plantations we visited to be about 700 feet above the plain, but those we saw at half that height, and even less, appeared more thriving, probably from having somewhat better soil, though the best is little more than mere sand. I have taken specimens from three or four gardens. Contrary to what we had been told the preceding night, I found that each garden had its little nursery, where the plants were growing to the height of four or five inches, as closely set as they could stand; from which I conceive that the plant requires absolutely a *free* soil, *not wet*, and *not clayey*, but of a texture that will retain moisture; and the best site is one not so low as that at which water is apt to spring from the sides of a hill, nor so high as to be exposed to the violence of stormy weather. There is no use in attempting to cultivate the plant on an easterly exposure, though it is sufficiently hardy to bear almost any degree of dry cold."—[Chinese Repository.]

From the New-Orleans Standard.

CLIMATE OF NEW-ORLEANS.

It may now be admitted, as fairly proved by sage philosophers, that the climate and health of a place depend as much on its locality as on its latitude in a particular zone or hemisphere; and that as the locality is improved by the arts of civilized life, the climate and health are proportionately meliorated. This is evinced by the experience of all ages and nations; and fortunately the experience of New-Orleans must shortly add another proof to corroborate the truth of this result.

The editor has occasionally recurred to this subject, in the humble hope of disabusing public opinion at a distance, founded on idle or interested rumors of the unhealthiness of this city; and as this opinion has bren one of the greatest obstacles to the greater population and trade of New-Orleans, he need not apologize for again adverting to it, and of acquiring the most authentic details to support his positions. He

From the London Gardener's Magazine.

ON THE EMPLOYMENT OF CATS IN THE PRESERVATION OF FRUIT FROM BIRDS.

"Robert Brook, Esq., of Melton Lodge, near Woodbridge, in Suffolk, has four or five cats, each with a collar, and light chain and swivel, about a yard long, with the large iron ring at the end. As soon as the gooseberries, currants, and raspberries begin to ripen, a small stake is driven into the ground, or bed, near the trees to be protected, leaving about a yard and a half of the stake above ground; the ring is slipped over the head of the stake, and the cat, thus tethered in sight of the trees, no birds will approach them. Cherry trees and wall-fruit trees are protected in the same manner as they successively ripen. Each cat, by way of a shed, has one of the largest sized flower-pots laid on its side, within reach of its chain, with a little hay or straw in bad weather, and her food and water placed near her.

"In confirmation of Mr. Kendall's statement, it may be added, that a wall of vines between 200 and 300 yards long, in the nursery of Mr. Kirke, at Brompton, the fruit of which in all previous seasons had been very much injured by birds, was last year completely protected in consequence of a cat having voluntarily posted himself sentry upon it."

From the Cultivator.

ROAD MAKING.

No branch of public improvement is of more importance to the farmer, nor indeed to the community at large, than the bettering of our common roads, particularly those which constitute the main avenues to market. These are the great arteries which transmit life, and vigor, and health, to every part of the business community. Our turnpikes have proved a failure, from a mistaken parsimony in their construction, and their needless multiplication. Railroads will do upon the great thoroughfares of commerce and travel; but for the transaction of internal commerce between the great towns and the country, good public roads should have precedence over all others: Because they dispense their benefits to all alike, and exempt us from the mortifying impositions of chartered wealth, and the officious impertinence of a host of subordinate officers. It is upon these public roads that the immense products of our farms are transported, and that we mostly receive in return the foreign commodities which we consume. If it cost the farmer twelve and a half cents per bushel to transport his grain to navigable waters, or to market, upon a bad road, the actual expense would be diminished more than three-fourths if he could quadruple his load upon a good road; for not only would there be a saving in animal power, and other expenses, to this extent, but there would be a further saving in the wear and tear of carriages, and in delays and accidents incident to bad roads. Roads, like the objects of most other expenditure, are cheapest when well made.

The business of road making has hitherto attracted very little of the public attention. Although the construction of roads is as much an art as common trades, and as much of a science as other branches of civil engineering, where good roads are the order of the day; yet with us the superintendence of their construction and repair is entrusted to all professions—to farmers, mechanics, lawyers, &c. who seldom understand much of the art, and know nothing of the science—and who are too often guided by self-interest, or caprice, and often rather mar than mend, the work of their predecessors.

We have derived many of our improvements from Great Britain; and from no country can we draw more useful teachings, in regard to road making, than from her. For although, fifty years ago, her roads were plobably not so good as ours now are, wonderful improvements have been made in them during the intervening half century. Her turnpikes, which cover, like a net-work, the surface of her island, are constructed upon the true McAdam plan, of preserving the earthy bed of the road always dry, by an efficient metal or stone covering, and sufficient side drains. Their parish roads are now undergoing a similar improvement. These works, which absord annually an appropriation of a million and a half pounds sterling, or more than six and a half million of dollars, give employment to the pauper population, and thus remunerate the public, in a measure, for this heavy national burden. To make our readers acquainted with some of the leading principles which govern, in the business of road-making, in Great Britain, we will state them, in a summary manner, as we find them laid down in the most recent British publications upon this subject, principally from the Farmers' Series of the Library of Useful Knowledge; promising, however, that although they apply mainly to metal covered roads, they are more or less applicable to the construction of all roads, where utility, durability and ultimate economy, are to be studied.

FOUNDATION.—Eminent men differ upon this point; the one party contending that a *pitched* foundation is necessary to make a substantial and good road; the other, that no pitching is essential. Pitching, as here used, is a foundation formed of large stones.

The weight of opinion is against their use. The best foundation, the use of large stones being dispensed with, is a sub-tratum kept perfectly dry by proper and effectual drainage. If one substance in road-making be harder than another, the harder substance should be upon the surface, and not at the foundation. To lay the softer upon the harder, must have the effect of sacrificing the inferior material.

DRAINAGE.—All exertion to construct or repair roads is considered unavailing until the bed of the road is freed from water, and secured against its return. Of what service can metal (stone) be when the road is immersed in water. Can it consolidate? Can it form a compact and hard substance, when water is amongst it, consuming as it were its very vitals? To correct and prevent a recurrence of the evil, substantial side ditches should be opened, so as to give a slope of one inch in 24, between the crowns of the road and bottoms. If open drains cannot be made on both sides, owing to the declivity of the surface, under drains should be constructed, with outlets, through the bed of the road to the lower side. And if springs exist in the scite of the road, their water must be concentrated, and conducted off by under drains. When a particular piece of road is observed to be continually heavy, and in a bad state, it is either caused by spring water, or is situated in a flat, from which the water cannot escape. These suggestions should not be lost to us. A principal defect in our roads, is the want of efficient drainage. Wherever water is permitted to remain, either upon the surface or substratum, in wet seasons there will be a slough, and the bed of the road will be entirely broken up.

THE SUBSTANCE OR THICKNESS OF MATERIALS.—Without a sufficient depth of consolidated materials, there will not be a resistance equal to the weight which a highway is subject to. There must be weight to resist weight. If the weight of metal forming the substance be of an imperfect quality, more will be required than when sound and clean. In proportion to the quantity of deleterious matter contained in the body (as earth, small gravel, soft stone, &c.) must the thickness be increased.—Any matter that is not of a sound nature has no power in road-making, and, therefore, the hard materials alone contained in the roads substance can be calculated upon as possessing the quality to resist weights. Experience has taught, that there can be no real security against a road giving way, taking the year through, unless twelve inches at least of good consolidated materials form the body of a road; and this upon a foundation rendered sound and dry by effectual drainage.

SORT OF MATERIALS.—Not the *hardest*, but the *toughest* stones, are the best. The first will break, the latter bend. The trappean and busaltic rocks are therefore preferred; then whinstone, dark colored granite and lime-stones.

PREPARATION AND SIZE OF MATERIALS.—The stone to be employed is first freed from dirt, and then broken so small as to pass through the inch meshes of a wire seive. Some allow the stones to retain the size of two inches, but none larger.—The tougher the nature of the material, the smaller the size should be.

QUANTITY OF MATERIALS TO BE LAID ON AT A TIME.—When a thick coat is laid on, the destruction of the material is very great before it becomes settled or incorporated with the road. The stones will not allow each another to lie quiet, but are continually elbowing one another, and driving their neighbors to the left and right, above and below. This wears off their angular points, produces mud and dirt, and reduces the stones to an angular form, and prevents their uniting and becoming firm. If there be substance enough already on the road, it will never be right to put on more than a

stone's thickness at a time. A cubic yard nicely prepared and broken, to a rod superficial, will be quite enough for a coat, and wi.l be found to last as long as double the quantity put on unprepared and in thick layers. There is no grinding to pieces when thus applied; the angles are preserved, and the materials are out of sight and incorporated in a very little time.—Each stone becomes fixed directly, and keeps its place, thereby escaping the wear and fretting which occur when they are applied in a thick stratum. On new roads, the covering should be applied in thin coats. As soon as one is embedded, apply another, until the desired power is obtained.

"To say nothing of the saving in a course of years, by the durability of a road formed under the new system, and which has been found in some cases, even where the traffic is considerable, by the side of a large town, to last for seven years without an additional stone being applied; to say nothing of the saving to the public in wear and tear of horses, carts and tackle; to say nothing of the comfort of travelling a smooth road, and also to say nothing of employment found for the poor; yet a road can be maintained good and perfect for half the sum, under the new system, which under the old, is expended without improvement."

SPREADING.—Cause the load to be shot down a short distance from the place upon which you wish the materials to be finally spread; and direct the spreader to cast every shovel full from him equally, all over the surface, and in such a manner as he would do if he were sowing wheat broadcast. The road will then be not thicker in one place than another, and a section will be produced perfect and true.

The writer on the subject of roads, in the Farmers' Series, suggests some alterations in the British road laws, which have a particular bearing upon our condition, and seem well worthy of our consideration.—He suggests,

1. That the business of road-making and repairing should be entrusted to the authority of a county, and not of a parish; because, first, the *public* interest will govern more, and *private* interest less; and secondly, the limited extent of the funds of a parish will not admit of giving such a salary to a surveyor—an officer there deemed indispensable—*as will secure the services of a person* EDUCATED *in the principles of road management, and otherwise qualified for the office of surveyor*—an office whose duties are here performed by path-masters.

2. That the means for maintaining roads be no longer obtained by statute labor, which is similar to our road assessments—because the law operates in this respect partially, and the time spent by the farmer in paying this tax, is worth more to him than it benefits the public. He recommends that the cartage be done by contract, by which he calculates a saving of 50 per cent. and that the manual labor be judiciously applied under the supervision of a competent engineer.

3. That the surveyor, or manager, be appointed for a longer period than one year, that he may be enabled to carry out a systematic plan of improvement, and give efficacy to his skill and science.

SCRAPING.—If it is desirable to keep a road dry at the foundation, it must be equally so at the surface.

SPRINGS, WEIGHTS, ETC. USED AS LOCOMOTIVE POWER.

We have received various communications on this subject, none of which need a reply, as they are all written by persons having little or no knowledge of the laws of matter; though possessed of considerable ingenuity in contriving and constructing. Should such persons take these laws of matter as they exist, and not as they imagine them, their inventive talent might be turned to some account.

Elementary works intended for the purpose of setting forth the laws of physics in the plainest language and without reference to technicalities, are naw to be procued in almost every village in the Union, and at an expense bearing a excceedingly small proportion to the sum wasted in useless experiment. Experience is a dear school. Quite recently we were shown by a gentleman of this city, an apparatus for perpetual motion, which cost more than thirty dollars, the necessary failure convinced him that he had been engaged in attempting to execute impossibilities.

Much has recently been said of an experiment in New-Jersey, in which a combination of springs was intended to furnish locomotive power We have never even noticed it, well knowing that failure was certain. The machinery in an attempt to put it into montion, has been partially destroyed as we undersed. This is to be regreted, as new attempts may be made, until a final test shall prove the error of the invention.

It must be distinctly understood, that no spring, weights, or fly-wheels can add power to a machine—that a man in winding up exerts as much power as the machine does during the continuance of its operation, and in some instances, where the machinery is complex a large portion of this power is lost.

Where a long contiued and uniform motion is desired without much power, clock machinery will do well enough—the moment power to any extent is desired we must resort to steam. This is as yet the only agent successfully applied to locomotion; experiments upon the use of magnetic electricity have been made upon a small scale, but the machinery is as yet too little understood in certain points of view to be able to furnish any useful hints.

We would earnestly recommend all persons who have any inclination to mechanical pursuits, to peruse before attempting to construct machinery, the work on Mechanics belonging to Lardner's Cabinet Cyclopedia—or some other popular treatise on this subject.

DESTRUCTION OF THE PATENT OFFICE.

Our readers will hear with surprise and regret, that the entire Patent Office and its contents have been destroyed by fire.

The destruction commenced in the General Post Office, under the same roof, and could not be arrested until the entire building was in ruins.

The vast collection of models, drawings, &c., the result of the combined ingenuity of the United States for years, is thus swept from existence—a loss never to be repaired.

What effect this accident will have upon the proceedings of the Office, we cannosay. Certainly much useless lumber is removed, for which regret in the slightest degree cannot be felt. It would be prudent in all, having unfinished business at this Office, to ascertain the position in which they are left, and repair any deficiencies caused by the fire, without delay.

It is a disgrace to us as a nation, that we cannot place our public offices, especially those of record, in buildings that are fire and water proof. Buildings for the use of the Patent Office, it is true, are now in progress, but they should have been erected long ago.

It is to be hoped, that every effort will be made to expedite their completion, while no expense should be spared in rendering the office every way suited to the wants of the department.

The following extract from Ure's Philosophy of Manufactures, (a work but little known in this country,) will be found to contain much useful knowledge for the practical and theoretical mechanician.

From Ure's Philosophy of Manufactures.

GENERAL VIEW OF MANUFACTURING INDUSTRY.

MANUFACTURE is a word, which, in the vicissitude of language, has come to signify the reverse of its intrinsic meaning, for it now denotes every extensive product of art, which is made by machinery, with little or no aid of the human hand; so that the most perfect manufacture is that which dispenses entirely with manual labor. The philosophy of manufactures is therefore an exposition of the general principles, on which productive industry should be conducted by self-acting machines. The end of a manufacture is to modify the texture, form, or composition of natural objects by mechanical or chemical forces, acting either separately, combined, or in succession.—

Hence the automatic arts subservient to general commerce may be distinguished into Mechanical and Chemical, according as they modify the external form or the internal constitution of their subject matter. An indefinite variety of objects may be subjected to each system of action, but they may be all conveniently classified into animal, vegetable, and mineral.

A mechanical manufacture being commonly occupied with one substance, which it conducts through metamorphoses in regular succession, may be made nearly automatic; whereas a chemical manufacture depends on the play of delicate affinities between two or more substances, which it has to subject to heat and mixture under circumstances somewhat uncertain, and must therefore remain, to a corresponding extent, a manual operation. The best example of *pure* chemistry on self-acting principles which I have seen, was in a manufacture of sulphuric acid, where the sulphur being kindled and properly set in train with the nitre, atmospheric air, and water, carried on the process through a labyrinth of compartments, and supplied the requisite heat of concentration, till it brought forth a finished commercial product. The finest model of an automatic manufacture of *mixed* chemistry is the five-colored calico machine, which continuously, and spontaneously, so to speak, prints beautiful webs of cloth with admirable precision and speed. It is in a cotton mill, however, that the perfection of automatic industry is to be seen; it is there that the elemental powers have been made to animate millions of complex organs, infusing into forms of wood, iron, and brass an intelligent agency. And as the philosophy of the fine arts, poetry, painting, and music may be best studied in their individual master-pieces, so may the philosophy of manufactures in this its noblest creation.

There are four distinct classes of textile fibres, cotton, wool, flax, and silk, which constitute the subjects of four, or, more correctly speaking, five distinct classes o factories; first, the cotton factories; second, the woollen; third, the worsted; fourth, the flax, hempen, or linen; and fifth, the silk. These five factories have each peculiarities proceeding from the peculiarities of its raw material and of its fabrics; but they all possess certain family features, for they all employ torsion to convert the loose slender fibres of vegetable or animal origin into firm coherent threads, and, with the exception of silk, they all employ extension also to attenuate and equalize these threads, technically styled yarn. Even one kind of silk which occurs in entangled tufts, called floss, is spun like cotton, by the simultaneous action of stretching and twisting.

The above-named five orders of factories are, throughout this kingdom, set in motion by steam-engines or water-wheels; they all give employment to multitudes of children or adolescents; and they have therefore been subjected to certain legislative provisions, defined in the *Factories Legulation Act*, passed by Parliament on the 29th August, 1833.

It is probable that 614,200 work-people are constantly engaged within the factories of the United Kingdom: of which number 561,900 belong to England and Wales; 46,825 to Scotland; and 5,475 to Ireland.* Fully five-tenths of them are under twenty-one years of age, and three-tenths of these young persons are females. It must be remembered, however, that besides these 614,200 inmates of factories, a vast population derives a livelihood from the manufactures of cotton, wool, flax, and silk, such as the hand-weavers, the calico-printers and dyers, the frame-work knitters, the lace-makers, lace-runners, muslin-sewers, &c. &c.

It appears from the Parliamentary Returns of 1831, that in Great Britain, out of a total population of 16,539,318 persons, there are of

Agricultural Laborers and Laboring Occupiers,	1,055,982,	and of
Manufacturing Laborers,	404,317	

Whence there are 1000 agricultural to 383 strictly manufacturing laborers.

Persons employed in retail trade, or in handicraft, as masters or workmen,	1,159,867	
Total adult persons employed in arts and trades,	1,564,184	being about fifty per cent. more than those engaged in agriculture.
The capitalists, bankers, professional and other educated men amout to	214,390	
Laborers non-agricultural to	618,712	
If we include in the agricultural department, the occupiers employing laborers, (few of whom, however, work,) we shall have to add	187,075	
To the above number,	1,055,057	
The total sum of Agriculturists is	1,243,057,	being only 80 per cent. of the adult males employed in manufactures, arts, and trades.

When we take into account the vastly greater proportion of young persons constantly occupied with factory labor, than of those occupied with agricultural labor, we shall then be led to conclude that at least double the amount of personal industry is engaged in the arts, manufactures, and trade, to what is engaged in agriculture. Considerably upwards of one-tenth of the population of this island is actually employed in manufactures; and probably little more than one-fifteenth in agriculture This conclusion ought to lead our legislative landlords to treat the manufacturing interests with greater respect than they have usually been accustomed to do. If we consider, moreover, how much greater a mass of productive industry a male adult is equivalent to, in power-driven manufactures, than in agriculture, the balance in favor of the former will be greatly enhanced.

France, which has for upwards of a century and a half tried every scheme of public premium to become a great manufacturing country, has a much less proportion than one employed in trade for two employed in agriculture. M. Charles Dupin, indeed, has been led by his researches into the comparative industry of France and of the United Kingdom, to conclude that the agricultural produce of our country amounted in value to 240 millions sterling, and that of his own to 180 millions sterling, being the ratio of three to two; and that our manufacturing power is inferior to that of France in the proportion of sixty-three to seventy-two; or as seven is eight. There can be no doubt that his agricultural estimate underrates France, as much as his manufacturing estimate underrates Great Britian.

This Island is pre-eminent among civilized nations for the prodigious development of its factory wealth, and has been therefore long viewed with a jealous admiration by foreign powers. This very pre-eminence, however, has been contemplated in a very different light by many influential members of our own community, and has been even denounced by them as the certain origin of innumerable evils to the people, and of revolutionary convulsions to the state. If the affairs of the kingdom be wisely administered, I believe such allegations and fears will prove to be groundless, and to proceed more from the envy of one ancient and powerful order of the commonwealth, towards another suddenly grown into political importance than from the nature of things.

In the recent discussions concerning our factories, no circumstance is so deserving of remark, as the gross ignorance evinced by our leading legislators and economists, gentlemen well informed in other respects, relative to the nature of those stupendous manufactures which have so long provided the rulers of the kingdom with the resources of war, and a great body of the people with comfortable subsistence; which have, in fact, made this island the arbiter of many nations, and the benefactor of the globe itself.* Till this ignorance be dispelled, no sound legislation need be expected on manufacturing subjects. To effect this purpose is a principal, but not the sole aim of the present volume, for it is intended also to convey specific information to the classes directly concerned in the manufactures, as well as general knowledge to the community at large, and

* The above numbers for Scotland and Ireland are taken from Mr. Leonard Horner's excellent Report as Factory Inspector; the number for England is computed on the recognized DATUM that it is twelve times greater for the cotton trade than that of Scotland. For the last official details see the Appendix.

* Even the eminent statesman lately selected by his Sovereign to wield the destinies of this commercial empire—Sir Robert Peel, who drives his family consequence from the cotton trade, seems to be but little conversant with its nature and condition.—See Dr. Carbutt's observations on the subject, next page.

particularly to young persons about to make the choice of a profession.

The blessings which physico-mechanical science has bestowed on society, and the means it has still in store for ameliorating the lot of mankind, have been too late dwelt upon; while, on the other hand, it has been accused of lending itself to the rich capitalists as an instrument for harassing the poor, and of exacting from the operative an accelerated rate of work. It has been said, for example, that the steam-engine now drives the power-looms with such velocity as to urge on their attendant weavers at the same rapid pace; but that the hand-weaver, not being subjected, to this restless agent, can throw his shuttle and move his treddles at his convenience. There is, however, this difference in the two cases, that in the factory, every member of the loom is so adjusted, that the driving force leaves the attendant nearly nothing at all to do, certainly no muscular fatigue to sustain, while it procures for him good, unfailing wages, besides a healthy workshop *gratis*: whereas the non-factory weaver, having everything to execute by muscular exertion, finds the labor irksome, makes in consequence innumerable short pauses, separately of little account, but great when added together; earns therefore proportionably low wages, while he loses his health, by poor diet and the dampness of his hovel. Dr. Carbutt of Manchester says, "With regard to Sir Robert Peel's assertion a few evenings ago, that the hand-loom weavers are mostly small farmers, nothing can be a greater mistake; they live, or rather they just keep life together, in the most miserable manner, in the cellars and garrets of the town, working sixteen or eighteen hours for the merest pittance."*

The constant aim and effect of scientific improvement in manufactures are philanthropic, as they tend to relieve the workmen either from nicetics of adjustment which exhaust his mind and fatigue his eyes, or from painful repetition of effort which distort or wear out his frame. At every step of each manufacturing process described in this volume, the humanity of science will be manifest. New illustrations of this truth appear almost every day, of which a remarkable one has jnst come to my knowledge. In the woollen-cloth trade there is a process between carding and spinning the wool, called *slubbing* which converts the spongy rolls, turned off from the cards, into a continuous length of fine porous cord. Now, though carding and spinning lie within the domain of automatic science, yet slubbing is a handicraft operation, depending on the skill of the slubber, and participating therefore in all his irregularities. If he be a steady, temperate man, he will conduct his business regularly, without needing to harass his juvenile assistants, who join together the series of card rolls, and thus feed his machine; but if he be addicted to liquor, and passionate, he has it in his power to exercise a fearful despotism over the young piecencrs, in violation of the proprietors benevolent regulations. This class of operatives, who, though inmates of factories, are not, properly speaking, factory workers, being independent of the moving power, have been the principal source of the obloquy so unsparingly cast on the cotton and other factories, in which no such capricious practice or cruelties exist. The wool slubber, when behind hand with his work, after a visit to the beer-shop, resumes his task with violence, and drives his machine at a speed beyond the power of the piecencrs to accompany; and if he finds them deficient in the least point, he does not hesitate to lift up the long wooden rod from his slubbing-frame, called a billy-roller, and beat them unmercifully. I rejoice to find that science now promises to rescue this branch of the business from handicraft caprice, and to place it, like the rest, under the safeguard of automatic mechanism. The details of this recent invention will be given in describing the woollen manufacture.

The processes that may be employed, to give to portions of inert matter, precise movements resembling those of organized beings, are innumerable as they consist of an indefinite number and variety of cords, pulleys, toothed-wheels, nails, screws, levers, inclined-planes as well as agencies of air, water, fire, light, &c., combined in endless modes to produce a desired effect. Ingenuity has been long exercised on such combinations, chiefly for public amusement or mystification, without any object of utility. In ancient times the statue of Memnon was celebrated for emitting harmonious sounds at sun-rise, and acted probably by concealed organ-pipes. The flying pigeon of Archytas was more manifestly an automatic mechanism, as it performed all the motions of an animal; and likewise the Android of Albert the Great, which opened a door when any one knocked, and muttered certain sounds, as if speaking to the visiter. The brass heads, or conversible busts of Abbe Mical, were probably a simple acoustic experiment on the transmission of sounds through tubes, like the Invisible Girl. More recently the flute-player of Vaucanson has puzzled the world. It presented the appearance of a human figure of the ordinary size, seated on a piece of rock, supported on a pedestal four feet and a half high. By the movements of its lips, fingers, and tongue, it modified the tones of a flute, and executed twelve different airs on the instrument. Vaucanson constructed also a drummer, which played on a flute with a three holed mouth piece, no less than twenty airs. Standing upright on a pedestal, dressed like a dancing shepherd, holding its flageolet in one hand, and a rod in the other, it beat the drum at one time in single taps, and at another in a long roll, as accompaniments to the flageolet tune. This automaton seemed to be truly the animated leader of the pleasures of a ball, skilful in augmenting or diminishing the breathing sounds of its instrument, with equal precision and taste.

The duck of the same celebrated mechanician, not only imitated the different movements of this animal, drinking, gobbling, swallowing, &c., but also represented faithfully the structure of the internal viscera for the digestion of the food. The play of every part necessary to discharge these functions was imitated to the life; for the duck drank dabbled in the water, stretched out its neck to take grain when offered to it in the hand drew back its head again to swallow it doubled the quickness of the masticating movements in passing the grain into the stomach, like the living duck, which always swallows its food very hastily. The grain was then ground in the gizzard, as preparatory to digestion; and finally subjected to excrementitious actions. Its wings, neck, head, and whole frame, were imitated bone by bone, and arranged in their natural form and order. When once wound up, the duck went through all its vital evolutions without needing to be touched. These machines were purchased by Professor Bayreuss, of Helmstadt.

The chess-player of M. Maelzel, now under exhibition at Paris, and formerly shown in this country, has been often described. It imitates very remarkably a living being, endowed with all the resouces of intelligence, for executing the combinations of profound study.

Raisin's automaton harpsichord was found to contain an infant performer.

Self-acting inventions like the preceding, however admirable as exercises of mechanical science, do nothing towards the supply of the physical necessities of society. Man stands in daily want of food, fuel, clothing, and shelter; and is bound to devote the powers of body and mind, of nature and art, in the first place to provide for himself and his dependents a sufficiency of these necessaries, without which there can be no comfort, nor leisure for the cultivation of the taste and intellect. To the production of food and domestic accommodation, not many automatic inventions have been applied, or seem to be extensively applicable; though, for modifying them to the purposes of luxury, many curious contrivances have been made. Machines, more or less automatic, are embodied in the coal-mines of Great Britain; but such combinations have been mainly directed, in this as well as other countries, to the materials of clothing. These chiefly consist of flexible fibres of vegetable or animal origin, twisted into smooth, tenacious threads, which are then woven into cloth by being decussated in a loom. Of the animal kingdom, silk, wool, and hair, are the principal textile products. The vegetable tribes furnish cotton, flax, hemp, besides several other fibrous substances of inferior importance.

Wool, flax, hemp, and silk, have been very generally worked up among the nations of Europe, both in ancient and modern times; but cotton attire was, till sixty years ago, confined very much to Hindostan, and some other districts of Asia. No textile filaments however are, by their facility of production as well as their structure, so well adapted as those of cotton to furnish articles of clothing, combining comfort with beauty and convenience in an eminent degree. Hence we can understand how cotton fabrics, in their endless variety of textures and styles, plain, figured, and colored, have within the short period of one human life, grown into an enormous manufacture, have become an object of the first desire to mankind all over the globe, and of zealous industry to the most civilized states. This business has received its great automatic developement in England, though it was cultivated to a considerable extent on handicraft principles in France a century ago and warmly encouraged by the government of that country, both as to the growth of the material and its conversion into cloth. The failure of the French however to establish a factory system prior to the English is a very remarkable fact, and proves clearly that me-

* Letter of 3rd of May, 1833, to Dr. Hawkins in his Medical Report, Factory Commission, p. 282.

chanicnl invention, for which the former nation have long been justly celebrated, is not of itself sufficient to found a successful manufacture.

We have adverted to the mechanisms of Vaucanson. This inventive artisan directed his attention also to productive machines. He constructed one for winding silk as long ago as 1749; one for doubling and twisting it in 1751; a tapestry loom in 1758; another for winding silk in 1770; a machine for laminating stuffs in 1757, and a plan of mounting silk mills in 1776. There can be no doubt as to the value of these inventions, as they were described with merited eulogiums in the above named years by the Academy of Paris. In 1776 he published an account of the Indian mode of weaving fine muslins in the wet state, showing that his attention had been turned likewise to the cotton trade.

The term *Factory*, in technology, designates the combined operation of many orders of work-people, adult and young, in tending with assiduous skill a system of productive machines continuously impelled by a central power. This definition includes such organizations as cotton-mills, flax-mills, silk-mills, woolen-mills, and certain engineering works; but it excludes those in which the mechanisms do not form a connected series, nor are dependent on one prime mover. Of the latter class, examples occur in iron-works, dye-works, soap-works, brass-foundries, &c. Some authors, indeed have comprehended under the title *factory*, all extensive establishments wherein a number of people co operate towards a common purpose of art; and would therefore rank breweries, distilleries as well as the workshops of carpenters, turners, coopers, &c. under the factory system But I conceive that this title, in its strictest sense, involvs the idea of a vast automaton, composed of various mechanical and intellectual organs, acting in uninterrupted concert for the production of a common object, all of them being subordinated to a self regulated moving force. If the marshalling of human beings in systematic order for the execution of any technical enterprise were allowed to constitute a factory, this term might embrace every department of civil and military engineering; a latitude of application quite inadmissable.

In its precise acceptation, the factory system is of recent origin, and may claim England for its birth-place. The mills for throwing silk. or making organzine, which were mounted centuries ago in several of the Italian states, and furtively transferred to this country by Sir Thomas Lombe in 1718, contained indeed certain elements of a factory, and probably suggested some hints of those grander and more complex combinations of self-acting machines, which were first embodied half a century later in our cotton manufacture by Richard Arkwright, assisted by gentlemen of Derby, well acquainted with its celebrated silk establishment. But the spinning of an entangled flock of fibres into a smooth thread, which constitutes the main operation with cotton, is in silk superfluous; being already performed by the unering instinct of a worm, which leaves to human art the simple task of doubling and twisting its regular filaments. The apparatus requisite for this purpose is more elementary, and calls for a few of those gradations of machinery which are needed in the carding, drawing, roving, and spinning processes of a cotton-mill.

When the first water-frames for spinning cotton were erected at Cromford, in the romantic valley of the Derwent, about sixty years ago, mankind were little aware of the mighty revolution which the new system of labor was destined by Providence to achieve, not only in the structure of British society, but in the fortunes of the world at large. Arkwright alone had the sagacity to discern, and the boldness to predict in glowiug language, how vastly productive human industry would become, when no longer proportioned in its results to muscular effort, which is by its nature fitful and capricious, but when made to consist in the task of guiding the work of mechanical fingers and arms, regularly impelled with great velocity by some indefatigable physical power. What his judgment so clearly led him to perceive, his energy of will enabled him to realize with such rapidity and success, as would have done honor to the most influential individuals, but were truly wonderful in that obscure and indigent artisan. The main difficulty did not, to my apprehension, lie so much in the invention of a proper self-acting mechanism for drawing out and twisting cotton into a continuous thread, as in the distribution of the different members of the apparatus into one co-operatire body, in impelling each organ with its appropriate delicacy and speed, and above all, in training human beings to renounce their desultory habits of work, and to identify themselves with the unvarying regularity of the complex automaton. To devise and administer a successful code of factory discipline, suited to the necessities of factory diligence, was the Herculean enterprise, the noble achievment of Arkwright. Even at the present day, when the system is perfectly organized, and its labor lightened to the utmost, it is found nearly impossible to convert persons past the age of puberty, whether drawn from rural or from handicraft occupations, into useful factory hands. After struggling for a while to conquer their listless or restive habits, they either renounce the employment spontaneously, or are dismissed by the overlookers on account of inattention.

If the factory Briareus could have been created by mechanical genius alone, it should have come in o being thirty years sooner; for upwards of ninety years have now elapsed since John Wyatt of Birmingham, not only invented the series of fluted rollers, (the spinning fingers usually ascribed to Arkwright,) but obtained a patent for the invention, and erected "a spinning engine without hands" in his native town. The details of this remarkable circumstance, recently snatched from oblivion, will be given in our treatise on the cotton manufactures. Wyatt was a man of good education, in a respectable walk of life, much esteemed by his superiors, and therefore favorably placed, in a mechanical point of view, for maturing his admirable scheme. But he was of a gentle and passive spirit, little qualified to cope with the hardships of a new manufacturing enterprize. It required in fact, a man of Napoleon nerve and ambition, to subdue the refractory tempers of work-people accustomed to irregular paroxysms of dilligence, and to urge on his multifarious and intricate constructions in the face of prejudice, passion, and envy. Such was Arkwright, who, suffering nothing to stay or turn aside his progress, arrived gloriously at the goal, and has forever affixed his name to a great era in the annals of mankind, an era which has laid open unbounded prospects of wealth and comfort to the industrious, however much they may have been occasionally clouded by ignorance and folly.

Prior to this period, manufactures were everywhere feeble and fluctuating in their development; shooting forth luxuriantly for a season, and again withering almost to the roots, like annual plants. Their perennial growth now began in England, and attracted capital in copious streams to irrigate the rich domains of industry. When this new career commenced, about the year 1770, the annual consumption of cotton in British manufactures was under four millions of pounds weight, and that of the whole of Christendom was probably not more than ten millions. Last year the consumption in Great Britain and Ireland was about two hundred and seventy millions of pounds, and that of Europe and the United States together four hundred and eighty millions. This prodigious increase is, without doubt, almost entirely due to the factory system founded and upreared by the intrepid native of Preston. If then this system be not merely an inevitable step in the social progression of the world, but the one which gives a commanding station and influence to the people who most resolutely take it, it does not become any man, far less a denizen of this favored land, to vilify the author of a benefaction, which, wisely administered, may become the best temporal gift of Providence to the poor, a blessing destined to mitigate, and in some measure to repeal, the primeval curse prononnced on the labor of man, "in the sweat of thy face shalt thou eat bread." Arkwright well deserves to live in honored remembrance among those ancient master-spirits, who persuaded their roaming companions to exchange the precarious toils of the chase, for the settled comforts of agriculture.

In my recent tour, continued during several months, through the manufacturing districts, I have seen tens of thousands of old, young, and middle-aged of both sexes, many of them too feeble to get their daily bread by any of the former modes of industry, earning abundant food, raiment, and domestic accommodation, without perspiring at a single pore, screened meanwhile from the summer's sun and the winter's frost, in apartments more airy and salubrious than those of the metropolis, in which our legislative and fashionable aristocracies

assemble. In those spacious halls the benignant power of steam summons around him his myriads of willing menials, and assigns to each the regulated task, substituting for painful muscular effort on their part, the energies of his own gigantic arm, and demanding in return only attention and dexterity to correct such little aberrations as casually occur in his workmanship. The gentle docility of this moving force qualifies it for impelling the tiny bobbins of the lace-machine with a precision and speed inimitable by the most dexterous hands, directed by the sharpest eyes. Hence, under its auspices, and in obedience to Arkwright's polity, magnificent edifices, surpassing far in number, value, usefulness, and ingenuity of construction, the boasted monuments of Asiatic, Egyptian, and Roman despotism, have, within the short period of fifty years, risen up in this kingdom, to show to what extent, capital, industry, and science may augment the resources of a state, while they meliorate the condition of its citizens. Such is the factory system, replete with prodigies in mechanics and political economy, which promises, in its future growth, to become the great minister of civilization to the terraqueous globe, enabling this country, as its heart, to diffuse along with its commerce, the life-blood of science and religion to myriads of people still lying "in the region and shadow of death."

When Adams Smith wrote his immortal elements of economics, automatic machinery being hardly known, he was properly led to regard the division of labor as the grand principle of manufacturing improvement; and he showed, in the example of pin-making, how each handicraftsman, being thereby enabled to perfect himself by practice in one point, became a quicker and cheaper workman. In each branch of manufacture he saw that some parts were, on that principle, of easy execution, like the cutting of pin wires into uniform lengths, and some were comparatively difficult, like the formation and fixation of their heads; and therefore he concluded that to each a workman of appropriate value and cost was naturally assigned. This appropriation forms the very essence of the division of labor, and has been constantly made since the origin of society. The ploughman, with powerful hand and skilful eye, has been always hired at high wages to form the furrow, and the ploughboy at low wages, to lead the team. But what was in Dr. Smith's time a topic of useful illustration, cannot now be used without risk of misleading the public mind as to the right principle of manufacturing industry. In fact, the division, or rather adptation of labor to the different talents of men, is little thought of in factory employment On the contrary, wherever a process requires peculiar dexterity and steadiness of hand, it is withdrawn as soon as possible from the *cunning* workman, who is prone to irregularities of many kinds, and it is placed in charge of a peculiar mechanism, so self-regulated, that a child may superintend it. Thus, to take an example from the spinning of cotton—the first operation in delicacy and importance, is that of laying the fibres truly parallel in the spongy slivers, and the next is that of drawing these out into slender spongy cords, called rovings, with the least possible twist; both being perfectly uniform throughout their total length. To execute either of these processes tolerably by a hand-wheel, would require a degree of skill not to be met with in one artizan out of a hundred. But fine yarn could not be made in factory-spinning except by taking these steps, nor was it ever made by machinery till Arkwright's sagacity contrived them. Moderately good yarn may be spun indeed on the *hand-wheel* without any drawings at all, and with even indifferent rovings, because the thread, under the two-fold action of twisting and extension, has a tendency to equalize itself.

The principle of the factory system then is, to substitute mechanical science for hand skill, and the partition of a process into its essential constituents, for the division or graduation of labor among artizans. On the handicraft plan, labor more or less skilled, was usually the most expensive element of production—*materiam superabat opus*; but on the automatic plan, skilled labor gets progressively superseded, and will, eventually, be replaced by mere overlookers of machines.

By the infirmity of human nature it happens, that the more skilful the workman, the more self-willed and intractible he is apt to become, and, of course, the less fit a component of a mechanical system, in which, by occasional irregularities, he may do great damage to the whole. The grand object therefore of the modern manufacturer is, through the union of capital and science, to reduce the task of his workpeople to the exercise of vigilance and dexterity,—faculties, when concentred to one process, speedily brought to perfection in the young. In the infancy of mecanical engineering, a machine-factory displayed the division of labor in manifold gradations—the file, the drill, the lathe, having each its different workmen in the order of skill: but the dexterous hands of the filer and driller are now superseded by the planing, the key-groove cutting, and the drilling machines; and those of the iron and brass turners, by the self-acting slide-lathe. Mr. Anthony Strutt, who conducts the mechanical department of the great cotton factories of Belper and Milford, has so thoroughly departed from the old routine of the schools, that he will employ no man who has learned his craft by regular apprenticeship; but in contempt, as it were, of the division of labor principle, he sets a ploughboy to turn a shaft of perhaps several tons weight, and never has reason to repent his preference, because he infuses into the turning apparatus a precision of action, equal, if not superior, to the skill of the most experienced journeyman.

An eminent mechanician in Manchester told me, that he does not choose to make any steam-engines at present, because with his existing means, he would need to resort to the old principle of the division of labor, so fruitful of jealousies and strikes among workmen; but he intends to prosecute that branch of business whenever he has prepared suitable arrangements on the equalization of labor, or automatic plan. On the graduation system, a man must serve an apprenticeship of many years before his hand and eye become skilled enough for certain mechanical feats; but on the system of decomposing a process into its constituents, and embodying each part in an automatic machine, a person of common care and capacity may be entrusted with any of the said elementary parts after a short probation, and may be transferred from one to another, on any emergency, at the discretion of the master. Such translations are utterly at variance with the old practice of the division of labor, which fixed one man to shaping the head of a pin, and another to sharpening its point, with most irksome and spirit-wasting uniformity, for a whole life.

It was indeed a subject of regret to observe how frequently the workman's eminence, in any craft, had to be purchased by the sacrifice of his health and comfort. To one unvaried operation, which required unremitting dexterity and dilligence, his hand and eye were constantly on the strain, or if they were suffered to swerve from their task for a time, considerable loss ensued, either to the employer, or the operative, according as the work was done by the day or by the piece. But on the equalization plan of self-acting machines, the operative needs to call his faculties only into agreeable exercise; he is seldom harassed with anxiety or fatigue, and may find many leisure moments for either amusement or meditation, without detriment to his master's interest or his own. As his business consists in tending the work of a well regulated mechanism, he can learn it in a short period; and when he transfers his services from one machine to another, he varies his task, and enlarges his views, by thinking on those general combinations which result from his and his companions' labors. Thus, that cramping of the faculties, that narrowing of the mind, that stunting of the frame, which were ascribed, and not unjustly, by moral writers, to the division of labor, cannot, in common circumstances, occur under the equable distribution of industry. How superior in vigor and intelligence are the factory mechanics in Lancashire, where the latter system of labor prevails, to the handicraft artizans of London, who, to a great extent, continue slaves to the former! The one set is familliar with almost every physico-mechanical combination, while the other seldom knows anything beyond the pin-head sphere of his daily task.

It is, in fact, the constant aim and tendency of every improvement in machinery to supersede human labor altogether, or to diminish its cost, by substituting the industry of women and children for that of men; or that of ordinary laborers, for trained artizans. In most of the water-twist, or throstle cotton mills, the spinning is entirely managed by females of sixteen years and upwards. The effect of substituting the self-acting mule for the common mule, is to discharge the greater part of the men spinners, and to retain adolescents and children. The proprietor of a factory near Stockport states, in evidence to the commissioners,

that by such substitution, he would save 50*l.* a week in wages, in consequence of dispensing with nearly forty male spinners, at about 25*s.* of wages each. This tendency to employ merely children with watchful eyes and nimble fingers, instead of journeymen of long experience, shows how the scholastic dogma of the division of labor into degrees of skill has been exploded by our enlightened manufacturers.

They are, in truth, much better acquainted with the general economy of the arts, and better qualified to analyse them into their real principles, than the recluse academician can possibly be, who from a few obsolete data, traces out imaginary results, or conjures up difficulties seldom encountered in practice. He may fancy, for example, that in a great establishment, where several hundred people are employed in producing fine goods, much time and expense must be incurred in verifying the quality and quantity of the work done by each individual. But this verification forms an integral step in the train of operations, and therefore constitutes no appreciable part of the cost of the manufactured article. Thus, for example, the reeling of yarn into hanks measures its length; the weighing of a few miscellaneous hanks determines the grist of the whole; and the *taker-in of work* rapidly ascertains its soundness.—For examining the quality of the very fine yarns used in lace-making, he is aided by machines which register rapidly the uniformity of its cohesive strength, and the exact volume which one hundred yards of it occupy. The lace-maker again, on his part, verifies the grist of all the thread he purchases, in the necessary act of filling the circular grooves of his tiny bobbins, preparatory to their entering into his machine.

The university man, pre-occupied with theoretical *formulæ*, of little practical bearing, is too apt to undervalue the science of the factory, though, with candor and patience, he would find it replete with useful applications of the most beautiful dynamical and statical problems. In physics, too, he would there see many theorems bearing golden fruit, which had been long barren in college ground. The phenomena of heat, in particular, are investigated in their multifarious relations to matter, solid, liquid, and aeriform. The measure of temperature on every scale is familiar to the manufacturer, as well as the distribution of caloric, and its habitudes with different bodies. The production of vapors; the relation of their elastic force to their temperature; the modes of using them as instruments of power, and sources of heat; their most effective condensation; their hygrometric agency; may all be better studied in a week's residence in Lancashire, than in a session of any university in Europe. And as to exact mechanical science, no school can compete with a modern cotton-mill.

When a certain elevation of temperature is made to give pliancy to the fibres of cotton or wool, the philosophical spinner sees the influence of caloric in imparting ductility and elasticity to bodies. The thermometer to indicate the temperature, and the hygrometer the humidity of the air, give him an insight into the constitution of nature unknown to the bulk of mankind. Of the different dilatations of different solids by increments of temperature, he has daily experience in the elongation of the immense systems of steam-pipes which heat his mill apartments, often extending three hundred feet in a straight line. On this scale, the amount of the expansion, and contraction, needs no micrometer to measure it, for it is visible to the eye, and may be determined by a carpenter's rule.

When fire-proof factories of iron and brick were first built, the columns which supported the successive floors, being hollow, were intended to admit steam, and to be the channels of communicating heat to the apartments. It was soon found, however, that the lengthening and shortening of a columnar range eighty or ninety feet high, by alternations of temperature, equal to 170° F., were so considerable, as to impair the stability of the most solid edifice, since metal changes its dimensions by heat with irresistible force. This project of frugality being therefore abandoned, horizontal, steam-pipes were suspended near the ceiling, by swinging rods of iron, which terminated at one end in a curved copper tube, for allowing the water of condensation to escape, and possessed of such pliancy as to give free play to the expansion and contraction. Ingenious expedients have been proposed for causing the lengthening of the main pipes to regulate the admission of steam into them, and to exclude it as soon as the temperature of the range had reached the proper pitch. An invention of this kind was made the subject of a patent many years ago, but it never came into general use, on account of certain irregularities in its performance. It was found very difficult so to adjust the lever mechanism of the valve, as to prevent its intercepting the flow of the steam whenever a certain portion of the long pipe was heated, long before the steam had reached the remoter end. Hence its uniform distribution was rendered precarious. Mill engineers have therefore satisfied themselves with insulating the steam-pipe ramifications from the building, leaving the circulation of the steam to be tempered by an ordinary stop-cock. The instrument, for which I have obtained a patent, under the name of the heat-governor, or thermostat, would furnish the factory proprietors with a self-acting means of regulating the temperature of their apartments, and of promoting their ventilation.

(To be Continued.)

TO PLOUGHMEN.

THE Subscriber has upwards of three hundred acres of meadow land, in the sod, near the city of New York, that he wishes to have PLOUGHED, as early in the course of the next year as practicable. He wishes to CONTRACT for the whole, or any part. It must be ploughed four inches deep, the furrow must be turned completely over, so that the whole will lie flat—to plough a great part of this land advantageously and speedily, a double team of light cattle is preferable to one pair of heavy oxen. Provender for men and cattle can be procured on the premises. Apply by letter, directed to Anthony Dey, 63 Cedar-street, corner Nassau-street, New-York, by mail or otherwise, stating terms etc.

rr4t—12m—48. A. DEY.

METEOROLOGICAL RECORD

For the month of July, 1836, kept at Avoylle Ferry, Red River, La., (Lat. 31° 10′ N. Long. 91° 59′ w,.) by P. G. VOORHIES.

JULY.

Days.	Morn.	Noon.	Night.	Wind.	Weather.	REMARKS.
1	72	86	78	calm	clear	Red River falling
2	72	88	80	..	..	
3	73	86	78	..	cloudy	
4	74	86	78	..	clear	
5	70	72	71	sw	cloudy	heavy rain and thunder at noon
6	74	87	79	calm	clear	cloudy at noon
7	75	88	78	..	..	cloudy and thunder at noon
8	75	68	78	SE	cloudy	heavy thunder at noon
9	76	89	86	calm	clear	at noon cloudy
10	76	92	86	..	..	
11	75	90	86	..	..	
12	74	89	86	..	..	
13	76	90	85	E	..	
14	75	88	84	calm	..	River rising
15	71	84	83	N light	..	evening calm
16	71	86	84	calm	..	all day
17	74	86	84	..	..	cloudy morning clear day, thudder southwardly
18	72	87	80	..	clear	thunder showers in the ev'ng from N. E. high
19	72	80	79	..	cloudy	all day, night clear
20	73	82	78	..	..	thunder in the evening
21	74	88	64	..	clear	
22	76	93	86	..	..	Red River falling
23	86	93	88	..	..	
24	82	90	88	s light	..	light flying clouds
25	82	86	84	calm	clear	
26	84	88	84	..	cloudy	all day
27	75	86	78	..	clear	evening cloudy
28	74	90	79	..	..	thunder showers in evening 3 to 5 P. M.
29	76	90	79	..	cloudy	evening light showers
30	76	84	74	..	..	foggy morning, afternoon a heavy thunder shower
31	74	83	79	..	all day	rain in the morning, cloudy all day

Red River fell this month 3 feet 1 inch—below high water mark 6 feet 4 inches.

METEOROLOGICAL RECORD.

For the month of August, 1836, kept at Avoylle Ferry, Red River, La., (Lat. 31° 10′ N. Long. 91° 59′ w,.) by P. G. VOORHIES.

AUGUST.

Days.	Morn.	Noon	Night.	Wind.	Weather.	REMARKS.
1	76	75	75	calm	cloudy	showers in the morning, heavy rain in the ev'g
2	77	86	80	calm	..	rain and thunder all day
3	74	88	82	..	clear	
4	76	82	80	SE	cloudy	heavy rain in the morning and all day and night
5	84	86	84	calm	..	
6	82	84	78	..	..	thunder and rain all day
7	76	88	84	..	..	rain in the morning and all day
8	73	90	82	..	..	
9	73	89	80	..	clear	
10	75	88	84	..	..	heavy rain all night
11	73	88	82	..	..	
12	76	86	84	..	..	
13	74	86	76	..	cloudy	
14	73	87	76	..	..	
15	78	86	72	..	clear	
16	76	86	84	..	cloudy	heavy thunder and lightning and rain from S. E.
17	75	88	84	..	clear	
18	76	88	76	..	..	
19	75	89	76	..	..	
20	74	84	82	..	cloudy	
21	67	81	78	..	clear	
22	66	82	80	..	..	
23	80	86	84	..	..	
24	73	87	84	..	..	
25	74	89	75	..	..	little rain and heavy thunder from S. E.
26	75	89	78	sw	..	thunder and high wind at noon from S. E.
27	73	82	78	calm	clear	high winds at noon from west
28	71	84	74	..	..	
29	76	86	79	..	..	light showers at noon
30	72	82				
31						

Red River fell this month 7 feet 6 inches— below high water mark 13 feet 10 inches.

NEW-YORK FARMER,

AND

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D. K. MINOR, and GEO. C. SCHAEFFER, } Editors and Proprietors.

FOR MARCH, 1837.

NEW SERIES—VOL. V.

LIFE IN ILLINOISE; AGRICULTURE, &c.—The following communication of E. R W., contains information not only interesting, but highly important, to thousands of our citizens who are struggling with adversity and want. It points out a path by which the man of small means and entire dependance may become, in a good degree, *independant*, with a farm, house, and fields of grain of his own.

It would be no less surprising to us, than it is to our correspondent, that so few of our citizens of small means avail themselves of the advantages of the fertile West, if we were not aware of the lack of correct information possessed by them, of the best mode of getting there, and then of living until they can *prepare* to live. There is, in truth, very little known here, of the *detail* of the process of becoming *farmers* in a new country—and it is of course viewed as a herculean task. This difficulty, however, might be easily obviated, if some intelligent western farmer, who has formerly been a resident of this city, and therefore familiar with our mode of living, would publish a small work, showing the condition, prospects, and advantages of the country, together with judicious directions how to remove a family in the most comfortable and economical manner; advising what necessaries of life ought to be carried, and what can be obtained there to advantage,—and pointing out the best manner of commencing operations when there.

Such a work, by a judicious hand, could not fail to be highly useful; and we doubt not our correspondent, E. R. W., is a suitable person to prepare it. If he will do so, we will give it all the publicity in our power.

We shall at least hold him to his *intimation* at the close of his communication; hope soon to hear from him again.

For the New-York Farmer.

SPRINGFIELD, Sangamon Co., Ill.

MESSRS. EDITORS,—Having had some opportunity, from travel and residence in this country for a year or two past, to become a little acquainted with the state of things in these Western regions, I thought I would add to my business concern a few observations for your paper. They may be of some service to those, whom high prices and hard time at the East have induced to think of other countries, where labor is more abundant and better compensated.

It has often struck me as somewhat a matter of astonishment, that among the multitudes who earn a scanty and precarious living by their labor in the eastern cities, so few of them can make up their minds to remove to these countries, where, with no greater exertions, they could soon acquire every necessary comfort and convenience of life. Does the mere facts of our having been born and brought up in the city of New-York, and formed local attachments there, opperate so powerfully that we would rather remain there in poverty and want, than to live in another State in plenty and comfort? Let me take the case of a very numerous class in the eastern cities, those females who sew for their living. There are some few of this class who receive an adequate compensation for their labor, but the number of such is small. The great majority of them do not receive more than half enough to support them comfortably. The case of widows with small children is particularly hard. Out of the miserable pittance they receive for their labor, the best they can do is to protract a joyless existence, half fed, and half clothed—their children stunted in body for want of proper and sufficient food, and degraded in mind through want of that mental and moral training which it is impossible for the parent to provide. How is it possible for those who receive from 12½ to 25 cents for making a shirt, vest, or pants., even of the commonest kind, to maintain themselves decently, much less support and educate two or three children. Even if they received 50 cents for making such articles, (which, however, is more than hundreds of them do receive,) it would be totally inadequate for their wants, under the present prices of things. In this country, things are very different. There is, throughout the whole country, a want of laborers, in almost every branch of business. And, of course, wages are high. Those seamstresses, for instance, who cannot procure enough work at 50 cents at the east, would here have the same kind of work *urged* on them, at most seasons of the year, for 75 cents to $1 00.

There is another branch of business in which many females might find profitable employment in this country, that is, as domestics in private families. The domestic here is not exactly the same as at the east. She is not a *servant* girl—she is the *help* of the housekeeper. It is not by any means a disreputable employment. Such persons readily command from $1 50 cts. to $2 a week: in public houses something more. Most kinds of journeymen's work are done by the piece in this country, and the prices are high enough to enable a good active hand, in almost *any* business, to earn from 10 to $18 a week. Perhaps the general rate is about $12. Common laborers are worth $1 a day—good farm hands, 15 to $18 a month, and scarcely to be had at those rates. In regard to the expenses of living in this town, an idea may be gathered from the following statement of prices. Beef and pork are 3 to 5 cents a pound. Vegetables of all kinds very abundant and cheap in their season, but usually scarce and high during winter. Potatoes 25 cents a bushel. Corn meal 50 cents. Flour $11 a barrel. Butter (in summer) 12½ cents per lb., this winter it commands from 20 to 25 cents. Flour is usually worth from 3½ to 5 dollars a barrel, but the wheat crop has partially failed for 2 or 3 years past, and consequently the article is high.—Fowls are worth from 8 to 12½ cents.—Families who are provident, and lay up their stores at the right season of the year, can live here moderately. A cow can be kept during summer without any expense, as they get their living on the prairies, and thrive on the abundant pasture they afford. To winter a cow would cost about 5 or 6 dollars, and for this small yearly expense, a family may have an abundant supply of milk.

One great advantage an enterprising family enjoys here, is the facility of getting a dwelling house of their own. A lot may

be had for 50 or 100 dollars, and a house, small, but sufficient for a contented family, may be put up for two or three hundred.—To do this is but the work of a year or two, and the man becomes a landholder,—his dignity is considerably heigntened thereby. He feels an interest at stake in the prosperity of the town, and is far more likely to apply himself diligently to business, than while he had no such inducements to influence him.

It may be asked, will these advantages continue long? I think a short consideration of the causes which give rise to them, will show that they are like to continue for many years. The farming interest is the principle one in this State, and is eminently prosperous. The land is fertile, the climate propitious, and such a thing as a general failure of crops, I believe, is unknown. From the ease with which new farms can be made from the prarie, and from the immense extent of prarie land now lying uncultivated, the prosperity of the farmer must long continue as great as at present. For he will have no inducement to settle in any neighborhood where he will not be well paid for his labor, when by going a little further, he can buy his land cheaper and sell his produce for more. As long as there is vacant land in different parts of this State and in adjoining States, the farming business will continue prosperous. It is the farmers who chiefly support the store keepers and mechanics of the towns, and of course the prosperity of the one will insure that of the other classes. For the same reasons, merchants or mechanics will have no cause for crowding into any place in such numbers as to overrun the business, when there are new towns continually springing up, where their commodities and labor will be in greater demand. Many persons feel an unwillingness to emigrate to the West, under the apprehension that a sort of semi barbarous state of society exists there—that the people are rough and uncouth in their manners, and without education and refinement. On this subject, I would remark, that most of the inhabitants of this State, are emigrants from the older States of the east and south, who brought with them all the education and refinement they possessed there. Enterprise and energy eminently characterise them as a body.—It was those traits of character that led them to seek this new country. In this town, you may go into a church on Sunday, and see an assembly as genteel in appearance, and as attentive and orderly in their department, as a New-York congregation. And you may also hear as good a sermon. There is a much larger proportion of children in Sunday schools in this town, than in the city of New-York; and most of the benevolent enterprises of the day are patronized with a good degree of liberality.—The people in their manners are usually sociable and pleasing. Strangers are welcomed with cordiality, and far less suspicion and distrust manifested than in the older countries. Upon the whole, it is only necessary to become acquainted with the character of the people here to admire it.

At some future time, I shall probably enlarge on some of these topics, and also communicate some information respecting farming in this country.

E. R. W.

For the New-York Farmer.

No. I.

GENERAL SKETCHES.—NEW-ENGLAND AGRICUTTURE.

By H. C.

I propose to sketch some very general views of the Agriculture of the Northern and Western parts of the country, which I have had recently the gratification of visiting. With much of New-England, I have been long acquainted; and this season has afforded me the opportunity of seeing some of the Western parts of New-York, the North-Western and central parts of Pennsylvania, and parts of Michigan, and Ohio, not under all the advantages, which I could have desired; but with as many as usually fall to the lot of travellers in their transit over the country, by the usual public conveyances.

There is a strong impression prevailing, and not without plausible reasons, that the Agriculture of New-England is on the decline; I do not mean in respect to the character, but the extent of the cultivation. Much less land in proportion to the population is under cultivation than was under cultivation twenty years ago; though in respect to the modes of cultivation, and the utensils employed, especially the plough, great improvements have been made. The amount of crops, from the same extent of land, has been greatly increased, and they are more carefully husbanded than formally. Yet it is a discreditable fact, that New-England is dependant upon other parts of the country for the common necessaries of life; and has little to export, excepting perhaps a small amount of beef; and the amount of this article, which New-England exports, does not exceed that, which is brought here alive from other parts of the country.

Maine, with an admirable wheat soil in many parts, grows comparatively little; as wheat flour with the Rochester, N. Y. brand upon it, is to be found far in the interior, a hundred miles, it may be, from the sea coast. Little Indian corn is produced, and small quantities of rye. Oats are raised in considerable amount; but not more than is demanded for home consumption. Excellent patatoes are produced; and of these as well as of hay some are sent to the capital of New-England, and there is an occasional shipment to the Southern cities. A good many cattle are driven from Maine to Brighton and likewise into the British provinces; and, as grass fed cattle, they are of a good description; but agriculture in Maine, though the State, notwithstanding its climate, possesses in this respect great advantages, cannot be set down as a primary interest of the State. The fisheries, and especially the lumber business, are the great objects of pursuit.

New-Hampshire is even in this matter, behind Maine, and this from the natural condition of the soil. To a stranger unacquainted with the hardihood and spirit of the people, it is matter of difficult solution how the inhabitants of this State are sustained. There are it is true, some sunny spots. Some extremely well managed and beautiful farms are to be met with in Greenland near Portsmouth. There is some good cultivation near Exeter and in Salisbury on the Merrimack. There is excellent, I may justly call it, pattern farming among the Shakers at Canterbury and Endfield, where all that persevering industry and untiring labor, applied with skill and judgment can accamplish, seems to have been done. There is excellent farming in that part of New-Hampshire, which lies upon Connecticut river; at Walpole, Charlestown, Claremont, Lebanon, Haverhill, and Lancaster. But a considerable portion of this State is doomed to perpetual unfruitfulness; is covered with mountains of granite, which defy all cultivation, and subject to late vegetation in the Spring and early Autumnal frosts, discouraging to the enterprize and often fatal to the labors of the husbandman. Indian Corn is in most parts of the State a precarious crop. Wheat, in those parts of the State where it is at all cultivated, has for three or four years, been much cut off by the grain worm. Rye is in no part of New-England a large crop; and this too, has suffered severely from the same pest. Some small amount of cattle are raised, but the severity and length of the winters make this an expensive process.—On some of the Connecticut river lands the crops of oats have been abundant, in some instances rising to ninety bushels to the acre; but nothing like this is to be generally calculated upon and hardly an approach to the necessary supply of bread stuff is at any time produced in the State. There are some

valuable intervale lands near the head waters of the Saco, which present favorable examples of good cultivation; but they are quite limited. Considerable portions of the State are well adapted to the growth of wool; and at present New-Hampshire may boast of some as well managed flocks; and the production of some as fine wool as any part of the world can furnish.

Vermont is, undoubtedly, the best as it is the most exclusively Agricultural State in New-England. The Indian corn crop in Vermont, is, however, a very precarious crop on account of the climate; and it produces at present, comparatively little wheat. Wheat was formerly cultivated in Vermont with much success, but for various reasons the cultivation for a few years past has fallen off. Wool is now the great object of attention, and the sheep husbandry is pursued with eminent skill and advantage. Vermont likewise may boast of some of the finest dairies in the country; and a large amount of butter and cheese are sent out of the State. The town of Barnet, on the banks of the Connecticut, has been long and deservedly celebrated for its careful cultivation and excellent dairy produce. The Agriculture of the towns on the Western side of the mountains, and on the lake shore is very superior.

The Agriculture of Massachusetts, is, with few exceptions, in a comparatively humble state. Of bread stuff, it produces but a small part of its necessary supply. Of wheat, a very small amount is raised. Of rye, much more than of wheat, but the amount is not large. Indian corn is more largely cultivated, but the farmers, who produce more than five hundred bushels per year, are a small number. Barley is cultivated to some extent in some parts of the State; in others the cultivation has been abandoned on account of the grain worm, believed to be the same by which the wheat has been cut off, but this fact is not as yet ascertained. Oats are a small crop, and great quantities of horse feed, oats, corn, and hay are imported into the sea ports and their vicinity, a considerable amount of broom corn is raised; and the brush is manufactured and sent into different parts of the Union; and the hops grown in this State, Vermont, and New-Hampshire, form in some years a notable article for exportation. Considerable beef is fattened in Massachusetts; and Worcester and Berkshire counties especially, are extensively engaged in the business of dairying. A large amoun of wool, and some of the finest qualities are grown in this State. The culture of the mulberry and the feeding of silkworms are begining to be objects of attension. Some hemp and tobacco are raised, but the cultivation is quite limited. Massachusetts however, though highly spirited, enterprising and liberal in her agricultural improvements by means of well managed societies, liberal donations from the State, and the disinterested efforts of many eminent individuals, has comparatively little agricultural wealth; the farms are generally small, and in many cases cultivated as an appendage to a trade, profession, or some commercial pursuit.

Rhode Island is essentially a manufacturing and commercial community. With the exception of a few favored spots, the soil is sterile and hard of cultivation. The Island itself, from which the State derives its name is singularly beautiful in its position and aspect, in most cases, of a strong and productive soil, and having singular advantages for obtaing manure on account of its proximity to the sea. Much sea grass, rock weed, and kelp are obtained, and in some places fish, the munhaden, which are taken in great abundance, are freely and successfully used. With the exception however, of the product of potatoes, and especially of onions, which it grows to a large extent, the State has no agricultural produce to export; and is almost wholly dependant on other places for its supply of bread.

Connecticut likewise is a manufacturing State; and agriculture scarcely exists as an exclusive profession. Some parts of Connecticut have been long remarked for the extensive cultivation of Onions, and a considerable amount of wool and tobacco is raised in the State, but its agricultural products are by no means equal to its wants. Connecticut has some large, and is full of small, manufacturing establishments; and no part of the United States has a greater appearance of neatness, comfort, and good economy. Its manufactured articles are found in all parts of the Union.

It is sometimes asked how, with a soil and climate not very propitious, the Yankees live, and live in comfort; and if they do not acquire large and overgrown fortunes, yet present more than a fair proportion of examples of humble competence, and as much independence as usually falls to the human condition? The answer may be comprehended in three words, industry, enterprise, and frugality. Climate and soil may be against them, but the condition in which Providence has thrown them, contributes to nourish a spirit of self-dependance, and to form a hardihood of character which is the foundation of their success. Their enterprise carries them into all parts of the country, and the world; and if the usual traits of the Yankee character go with them, their enterprise seldom disappoint their calculations.

I trust it was not mere prejudice, for of that I should feel quite ashamed; that in travelling through the new parts of the country, I persuaded myself that I could, in most cases, point out a Yankee settlement or homestead, without inquiry. In several instances, where I attempted the experiment, the inquiry confirmed my conjectures. There was a certain air of carefulness about the house and out-buildings, which distinguished them from most others. I am far from thinking their ways are always best; and as it respects agriculture, they are far behind the Pennsylvania Farmers; but in the capacity of "getting along" on small means, and with honor, comfort, and independence, no people surpass them.

The Yankee too has an officiousness in other men's matters, which if it has its evils, as it is sometimes complained of, it is not without its advantages. He no sooner plants himself in any situation, than he has a "notion" that the community would be better for good roads, secure bridges, a school house, an academy, and a meeting house; and these matters, in general standing in pretty close connection, usually, though silently, announce, who presides over the municipality. The Yankees have a propensity too to have their houses painted, their yards neatly secured, their gates on the hinges and shut, and the pigs kept out of the hall and the front parlour.

This appearance of neatness, care, frugality, and thrift, indicates generally the residence of a Yankee settler; and leads us back to the circumstances under which such a character is usually formed.

With a hard and unpropitious soil, a severe climate, and a population which, if confined to its own resources, would press sorely upon its means of subsistence, he is compelled to labor and exertion, that he may live; obliged to gather up the fragments that remain, so that nothing shall be lost, he is trained in habits of extreme frugality; and his invention is continually toned and stimulated by the great spur of necessity, and a spirit of enterprise aroused and cherished, that he may increase his resources. When the Yankee emigrant carries these habits with him to his new place of residence among the fertile lands of the West, success and wealth are certain; but it too often happens, that when he finds himself in a situation where such constant and strenuous exertions are not required, and he discovers that even moderate exertion is most amply rewarded, far beyond his experience and even his imagination, the love of ease, almost an essential element in the human constitution, prevail over his